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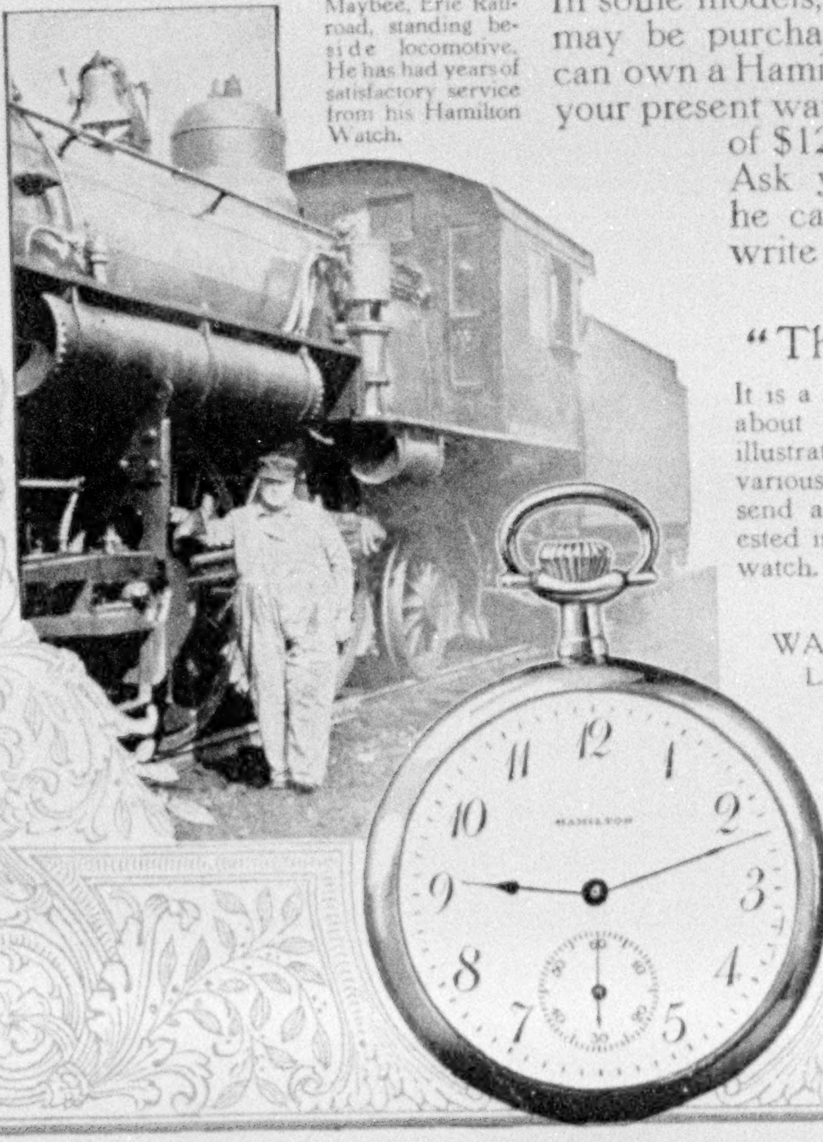

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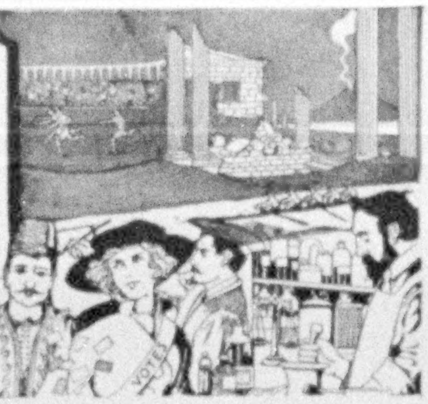

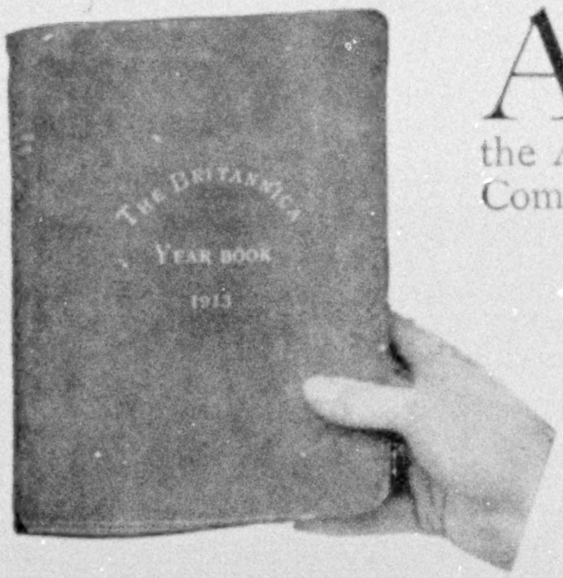

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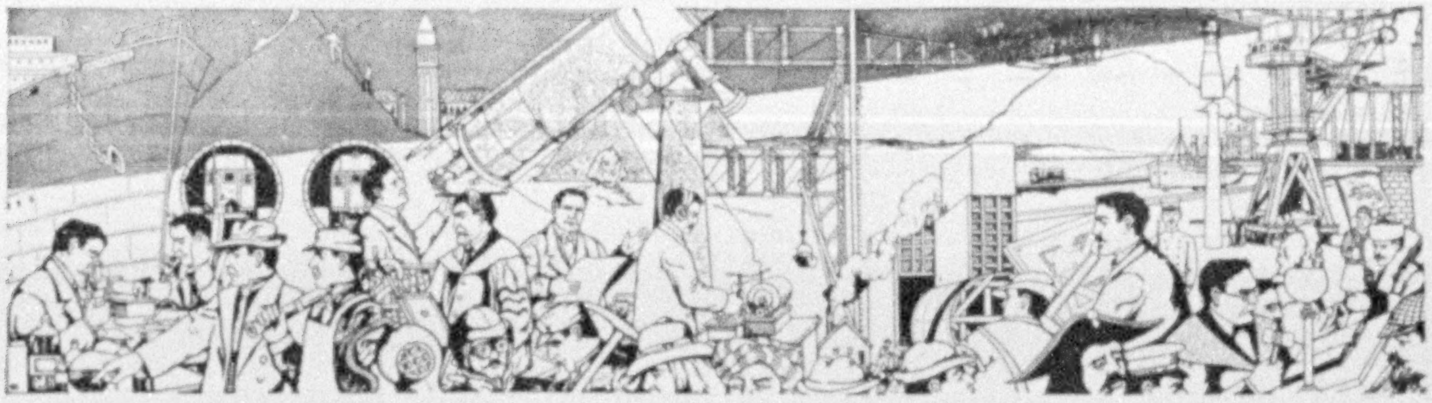

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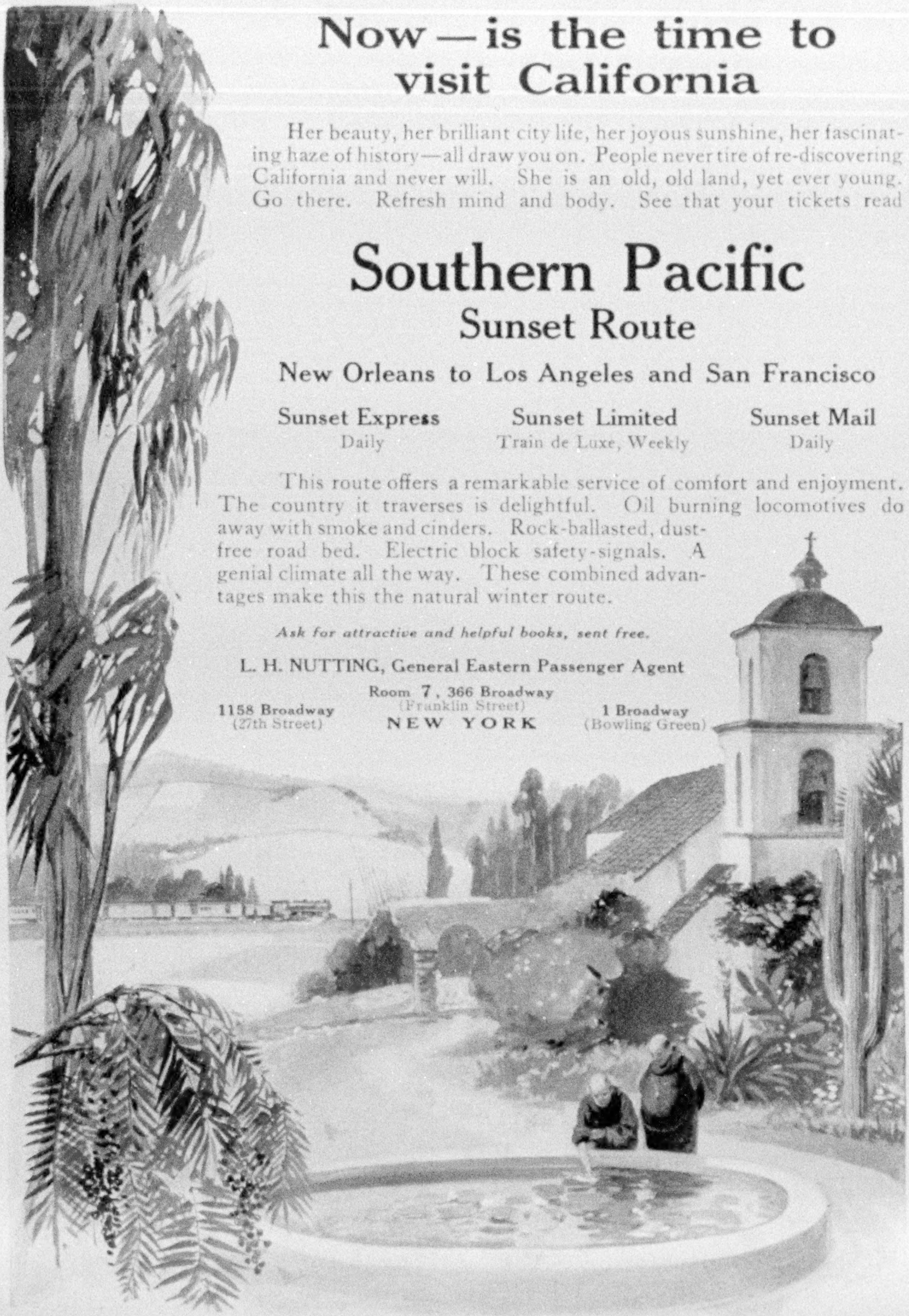

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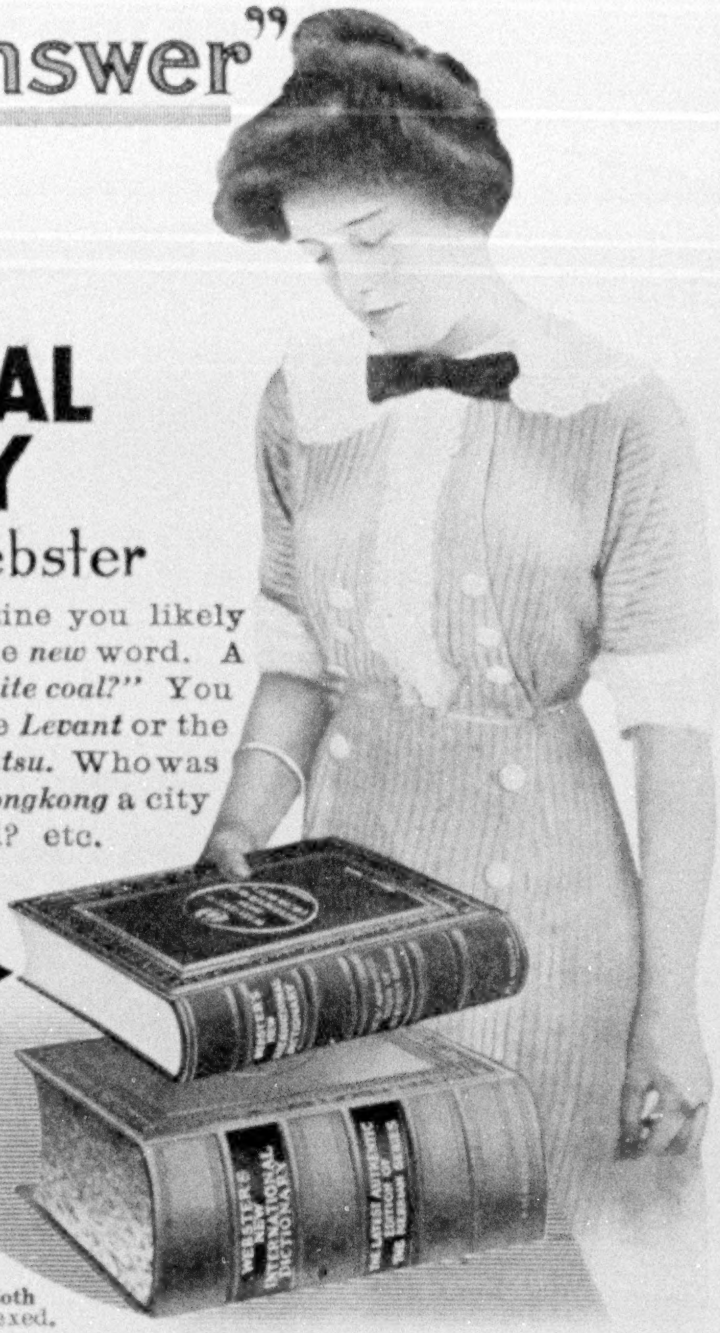

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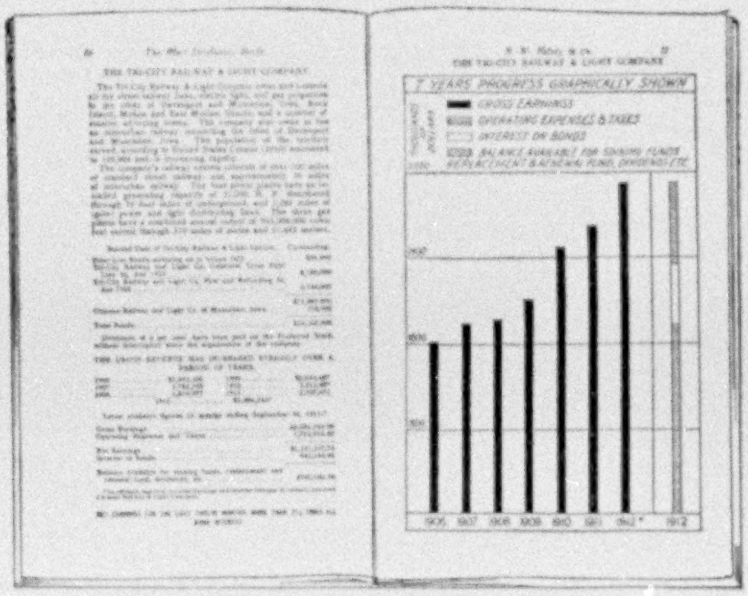

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THE NATIONAL GEOGRAPHIC MAGAZINE

OYSTERS: THE WORLD'S MOST VALUABLE WATER CROP

By HUGH M. SMITH

U. S. DEPUTY COMMISSIONER OF FISHERIES

Author of "Making the Fur Seal Abundant," "Federal Fish Farming," "Our Fish Immigrants," "America's Most Valuable Fishes," "The Pearl Fisheries of Ceylon," "King Herring," "Some Great Fishes of the Sea," "Brittany, the Land of the Sardine," etc., in the National Geographic Magazine.

OYSTERS are the most popular and most extensively eaten of all shellfish; economically, they are the most important of all cultivated water products and, with the single exception of the sea herrings, the most valuable of all aquatic animals. Zoologically considered, oysters are lamellibranchiate mollusks of the genus Ostrea.

In at least 35 countries oysters support a special fishery, and in various other countries enter into the food supply. On the shores of all the temperate and tropical oceans and seas, oysters occur in greater or less abundance; but the supply in the North Atlantic exceeds that of all the other waters combined. Not less than 150,000 men and women are engaged in the oyster industry; and the capital invested in vessels, boats, apparatus, oyster lands, and cultural establishments aggregates many million dollars.

The oyster crop of the world at the present time amounts to over 42 million bushels and is valued at nearly $25,000,000. Of this output, the share of the United States is 88 per cent of the quantity and 69 per cent of the value. Of the remaining portion, fully 65 per cent of the quantity and 50 per cent of the value belong to France.

At least 100 species are known, with a rather wide range in size, shape, habits, flavor, and food value. Some excellent species exist in the equatorial and subtropical regions, but the best occur in temperate climes. The northern limits of their habitat are the Gulf of St. Lawrence and southern Norway in the Atlantic, and Hokkaido and Puget Sound in the Pacific.

Oysters produce an immense number of young in order to compensate for the heavy mortality that occurs at all stages of growth, but particularly in the early months. It is an astonishing biological fact that in some species of oyster each sex is represented by a different individual, as in the oyster of the Atlantic coast of North America; while in other species both sexes are united in one individual—the male stage alternating with the female, as in the common oyster of the Atlantic coast of Europe.

After the oyster attains a size that is visible to the unaided eye, it is incapable of changing its position. This is in marked contrast with the newly born young, which is a free-swimming creature, floating about with tides and currents, and quite as likely to settle down on a far-distant bank or bar as to rejoin its progenitors.

Photo from Dr. Hugh M. Smith

THE OYSTER FLEET LYING OFF BALTIMORE

Baltimore is the chief point of distribution for the oysters produced in Chesapeake Bay, which is the greatest oyster ground in the world. Baltimore is also one of the great centers of the oyster canning industry. Oysters were first canned at Baltimore in 1820 by a certain Thomas Kennett, but it was not until 1850 that oyster canning became a distinct and permanent industry. Until 1900 Baltimore held the undisputed control of this industry, but since that time other canneries have been opened in the South. The expression "cove oyster," which now seems synonymous with canned oysters, was originally given to the small oysters found in the coves on the west bank of Chesapeake Bay between Baltimore and the mouth of the Potomac.

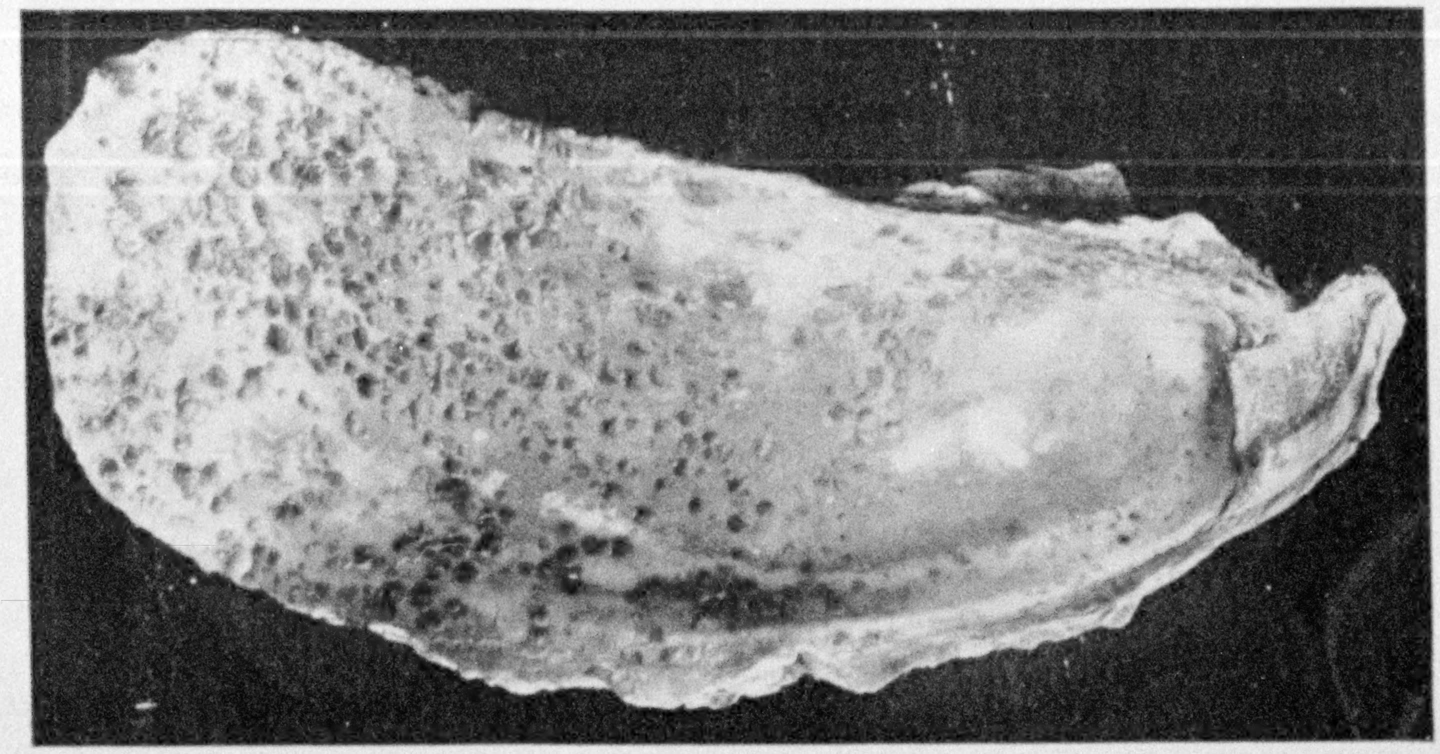


Photo from Dr. Hugh M. Smith

VERY YOUNG OYSTERS ("SPAT") ATTACHED TO THE INSIDE OF AN OYSTER SHELL WHICH HAS BEEN "PLANTED" FOR THIS PURPOSE

The planting of suitable material, such as old shells, gravel, etc., to which young oysters may attach themselves after the free-swimming stage, is an exceedingly important branch of the oyster industry, for any of the young falling on mud or sand are lost.

Of the millions of microscopic young liberated by a single full-grown oyster, only an exceedingly small percentage become attached to a suitable bottom, form a shell, and enter on a career that will terminate on the table in two to four years. When the temperature, density, tides, and currents are favorable, the young will settle on an existing bar or bed, covering the shells of the old oysters and any other hard surfaces or objects that may be present. All the young that fall on a muddy or soft sandy bottom, or on surfaces that are slimy, are lost. Oyster culture therefore aims primarily to conserve the free-swimming young, which it accomplishes by sowing clean oyster-shells or other "cultch" to which the "spat" can attach, or by collecting the young on tiles or brush raised above the bottom or suspended between surface and bottom (see pages 269 and 274).

CHINA AND ITALY CULTIVATED OYSTERS 2,000 YEARS AGO

Oysters have been under culture longer than any other shellfish and, indeed, than any other water creature. A simple type of cultivation, with the formation of artificial beds, flourished in China at a very remote period and probably antedated by some centuries the inception of oyster culture in Italy, about the year 100 B. C. With the advance of civilization and the increase in population, oysters were in greater demand and of necessity came under cultivation in all the important maritime countries of Europe, where, at the present time, fully 90 per cent of the output represents oysters that have undergone some kind of culture. In other parts of the Old World the growing of oysters by artificial means has become an important industry, while in the Western Hemisphere oyster farming has progressed to such a point that the annual crop now exceeds the total product of the rest of the world.

Oysters are thus become the most extensively cultivated of all aquatic animals, and the yearly product of the oyster farms is many times more valuable than that of all other aquicultural operations combined.

The cultivation of oysters is made necessary by the exhaustion of the natural beds; it is made possible by private ownership or control of oyster-producing bottoms; and it is greatly facilitated by

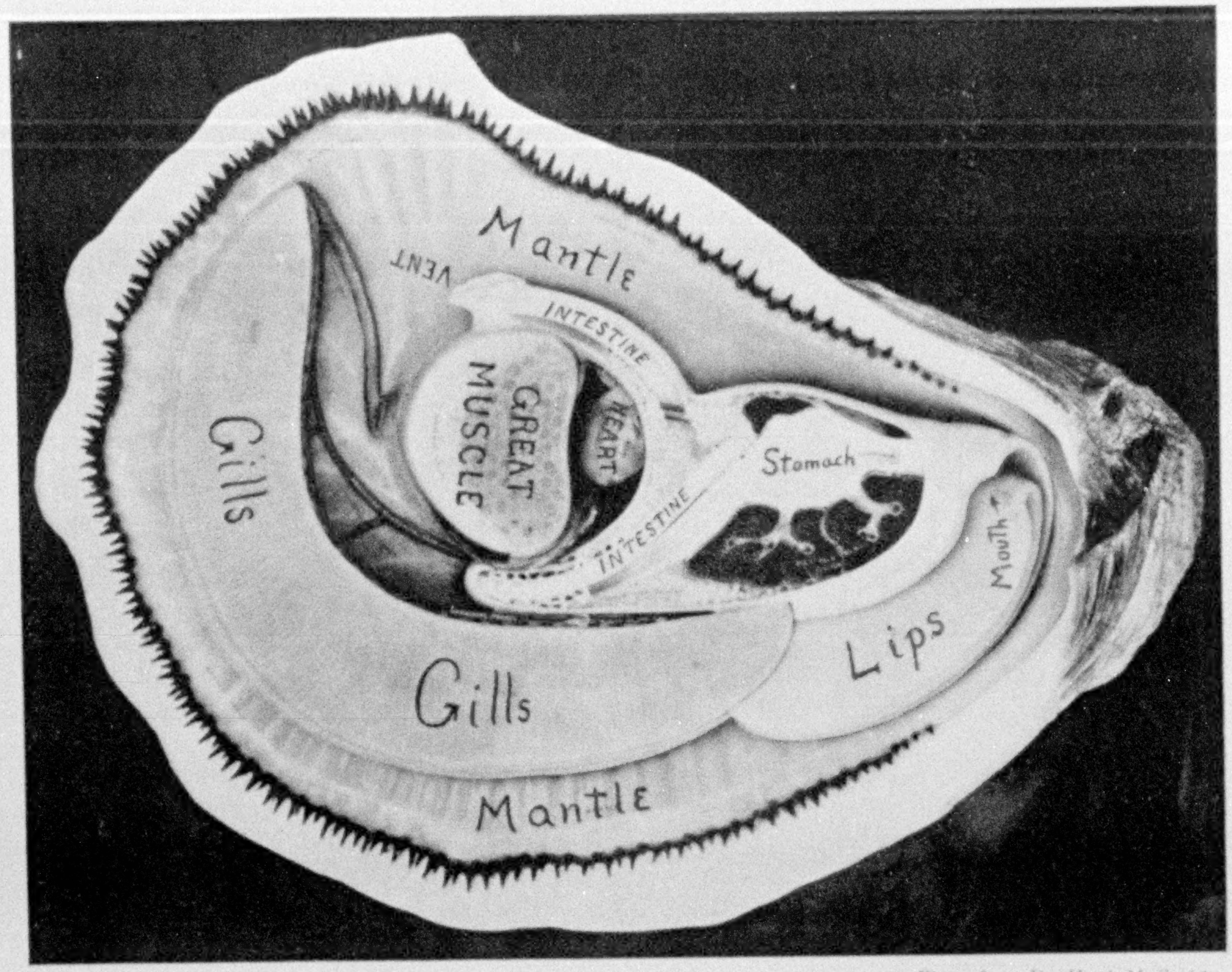


Photo from Dr. Hugh M. Smith

ANATOMY OF THE OYSTER

"It is an astonishing biological fact that in some species of oyster each sex is represented by a different individual, as in the oyster of the Atlantic coast of North America; while in other species both sexes are united in one individual—the male stage alternating with the female, as in the common oyster of the Atlantic coast of Europe" (see text, page 257).

the peculiar susceptibility of oysters to increase and improvement by artificial means.

THE OYSTER HAS MANY ENEMIES

The human animal is not the only one that looks with favor upon the edible qualities of the oyster. At every stage in its career it is attacked by a horde of dangerous enemies, some of which are most destructive after the oyster has put on its stoutest armor and would seem to be almost invulnerable. Before it becomes attached, the delicate oyster fry is extensively consumed by adult oysters and various other shellfish, as well as by fishes like the menhaden, which are able to strain their food from the water. When the oyster attains its shell, a new set of shellfish enemies, provided with drills, begin their attacks and extract the soft parts through minute holes made in valves. In some localities various snail-like mollusks do immense damage to the beds of oysters in their first year.

The oyster growers of Long Island Sound and adjacent waters suffer large losses from the inroads of starfishes, which come in from deep water and move in waves over the bottom, devouring every oyster in their path and sometimes destroying several hundred thousand bushels of marketable oysters in one State in a single season. It is remarkable that a weak creature like the common starfish should be able to prey on an animal so strongly fortified as an oyster. The starfish acts by attaching

itself to the lips of the oyster-shell and exerting a steady and long-sustained traction with each of its numerous small suckers. After a time the powerful adductor muscle of the oyster becomes fatigued, the valves open, and the starfish inserts its stomach and devours the helpless oyster at leisure.

Other enemies of the grown oyster are fishes with powerful jaws armed with crushing teeth. On the Atlantic coast the most destructive fish is the black drum, a school of which may literally clean out an oyster-bed in one night. On the Pacific coast a species of stingray is the chief offender, and to stop its ravages the oyster growers have been obliged to inclose the beds by stout palisades.

Further damage is done to oysters by the encroachments of mussels, barnacles, sponges, etc., which sometimes occur so densely on the shells as to cut off food and oxygen, and thus greatly retard the growth of the oysters.

OYSTERS ARE CHEAPEST AND MOST POPULAR IN THE UNITED STATES

In any consideration of the world's oyster industry the United States necessarily receives first and most prominent mention, for there is no country in which oysters occupy a more important place. The output here is larger and more valuable than elsewhere, and the relative importance of oysters compared with the total fishery product is greater. Furthermore, among the leading oyster-producing countries the cost of oysters to the consumer is least and the per caput consumption is greatest in the United States. Additional evidence of the conspicuous position held by the oyster is seen in the facts (1) that it is taken in every coastal State except one; (2) that in 15 States it is the chief fishery product, and (3) that it is the most extensively cultivated of our aquatic animals.

The annual oyster output at this time is about 37,000,000 bushels, with a value to the producers of nearly $17,000,000. The yield has increased 70 per cent in quantity since 1880. Under the favorable conditions now prevailing, the output is becoming larger year after year in the country as a whole. The limit of production has perhaps been practically reached in certain States, but in most States the industry is capable of great expansion. In recent years the South Atlantic and Gulf States have experienced a noteworthy augmentation of yield as a result of increased appreciation of the oyster resources and increased encouragement given to oyster culture.

The seven leading oyster States at this time are Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia, and Louisiana, in each of which over a million bushels of oysters are marketed annually. Virginia is the ranking State as regards production, with over 6 million bushels, followed by Maryland, with over 5½ million bushels, and Connecticut, with about 4 million bushels. As regards value of oysters taken, Connecticut and New York lead, with over 2½ million dollars each, followed by Virginia and Maryland, with about 2¼ million dollars each. In other words, an average bushel of oysters in Connecticut and New York brings the oysterman 80 cents, while a bushel in Maryland and Virginia brings less than 40 cents.

CHESAPEAKE BAY IS THE WORLD'S GREATEST OYSTER GROUND

The body of water which produces more oysters than any other body of water in the United States or, in fact, in the whole world is Chesapeake Bay. The latest statistics of the oyster industry show the preponderating importance of the bay: an output of over 11 million bushels, valued at more than $4,250,000, or 30 per cent of the quantity and 25 per cent of the value of the entire oyster crop of the United States for 1908.

While the oyster yield of Chesapeake Bay and tributaries in all recent years has been considerably less than formerly, nevertheless the industry today is in a healthier condition than ever before. This apparently paradoxical statement is explained by the fact that whereas in earlier years a very large proportion of the product was obtained from public beds, whose depletion had already begun and whose ultimate destruction was inevitable, now an annually increasing proportion of the oyster output is taken

Photo from Dr. Hugh M. Smith

OYSTERS GROWING ON AN OLD LANTERN

The tendency of the oyster to attach itself to any convenient object has been made use of by the oyster culturist from time immemorial. The Romans cultivated the oyster, particularly at Lake Avernus, and the traditional method of culture is still practiced today at Lago Fusaro, near Naples.

Photo from Dr. Hugh M. Smith

OYSTERS GROWING WITHIN AND ON A YEAST-POWDER BOTTLE

In America and England the general practice is to use old oyster-shells as cultch, but in France and Holland the spat is generally collected on concave earthenware tiles. It is necessary to detach the oysters from the tiles before they are a year old, and, as this could not be done without injury were the young directly attached to the hard tile, a coating of lime or soft mortar is used to cover the tile, and from it the oysters can be easily removed with a sharp knife.

from grounds under private control and represents an actual aquicultural crop.

In Virginia about 50 per cent of the value of the State's oyster industry is contributed by grounds under cultivation, and in Maryland an increasingly large proportion is from private beds—a condition which 25 years ago would have been regarded as almost impossible, for at that time these States were firmly committed to the policy of making their oyster industry depend on public or natural beds and restrictive measures, and discouraged the general inauguration of oyster planting on public oyster grounds.

This policy was in strong contrast with that in the next most important oyster-producing region, namely, Long Island Sound, where the States of New York and Connecticut had cut loose from the old fetish of the sanctity of public oyster grounds, had leased or sold those grounds for planting purposes, and had assumed the front rank, although their natural advantages for oyster growing were much inferior to those in Chesapeake Bay.

OYSTER CULTURE IN THE UNITED STATES

The rank early attained by the United States in the oyster industry was due to the great area of the oyster-beds; but the maintenance of that rank depends on the general adoption of oyster culture as the only certain means of insuring a yearly increasing crop that will keep pace with the increasing demand.

Of the oysters marketed last year, 50 per cent came from private or cultivated grounds. Owing, however, to the improvement in the quality and shape of oysters by cultivation, the product of the private beds represented 70 per cent of the total value of the yield of market oysters. While the quantity of oysters taken from cultivated grounds in the United States is larger than in all the remainder of the world, yet the proportion of such oysters to the total output is much smaller than in any other important oyster-producing country.

Wherever the fishery is active and the demand great, the necessity for artificial measures to maintain the supply sooner or later becomes manifest. Some of the States long since ceased to place reliance on natural beds as sources of supply, and encouraged oyster culture by leasing or selling all available grounds to prospective oyster farmers, and each year other States are falling in line for progressive methods.

The American oyster industry has been greatly retarded in one of the most important regions by the failure of the States to adapt themselves to existing conditions and by their deep-seated prejudice against innovations based on modern conceptions and experience.

Nowhere in this country is there any excuse for continuing to rely on public oyster grounds as sources of supply, and the proposition to discourage or prohibit individual control of land for agricultural purposes would not be less absurd than to prevent or retard the acquisition of submerged lands for aquicultural purposes.

The prosperous condition of our oyster industry at present is directly due to the more general acceptance of more rational standards as regards oyster culture, and it is only a question of a few years when there will be unanimous recognition, as an orthodox fact, of what a short time ago would have been regarded as the rankest economic heresy, namely, that natural oyster-beds as a general proposition are to be considered nuisances, whose perpetuation delays progress and impairs the prosperity of the oyster industry.

Reduced to its simplest terms, oyster culture in the United States consists in (1) acquiring suitable submerged bottom, (2) cleaning and preparing that bottom for the growth of oysters, (3) sowing thereon shells or other material ("cultch") for the attachment and growth of the young oysters, (4) insuring the production of larval oysters by the proximity of natural or planted beds of adult oysters, (5) protecting the oyster beds from enemies, (6) transplanting as occasion requires to prevent overcrowding and to facilitate growth and fattening, and (7) culling and sorting for market.

XUM

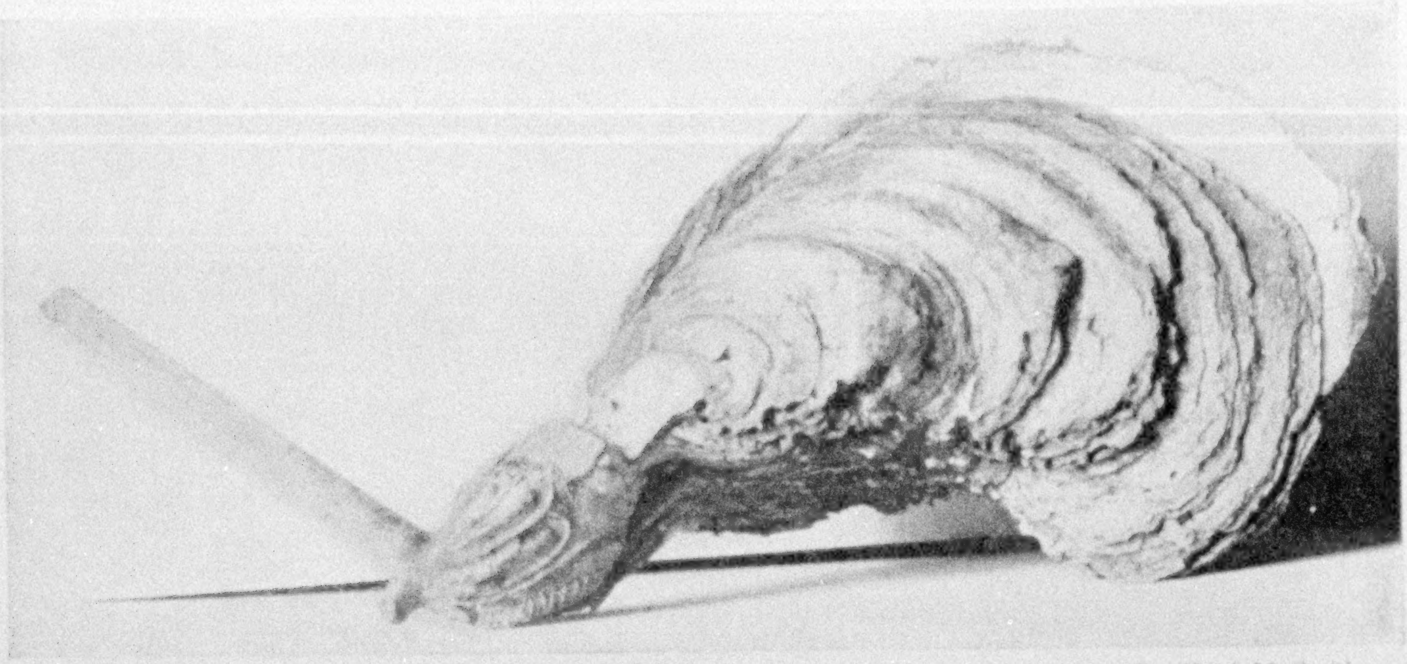


Photo from Dr. Hugh M. Smith

OYSTER GROWING ON A PIPE

The oyster is so large and the pipe so small that at first sight it would hardly seem possible that the oyster grew from a little disc only about one-twentieth of an inch in diameter. While the young oysters are in the free-swimming stage they are even smaller, being about 1/150th part of an inch long and almost transparent.

"FLOATED" OYSTERS MAY BE DANGEROUS

A prevalent practice among oyster growers in some sections is to transfer oysters from salt water to brackish or less dense water for a short time before shipping to market, with the object of making them take on an illusive appearance of fatness by the rapid absorption of fresher water, while the more saline fluids in the tissues slowly pass out. This process, known as plumping, floating, or fattening, results in a swelling of the oysters to the full capacity of the shell, but adds nothing to their nutritive value or flavor. On the contrary, it extracts certain nutritious ingredients and replaces them with water. Chemical tests have shown that this sadly misnamed process of "fattening" deprives the oysters of 10 to 15 per cent of their food value, while increasing their weight from 10 to 20 per cent. A similar result is seen when oysters are placed in fresh water or brought into contact with melting ice after removal from the shell.

More serious, however, than the loss of nutritive properties is the danger from contamination by pathogenic bacteria when the floats are situated within the range of sewers or other sources of pollution. It is well known that oysters imbibe disease germs with their food, and such germs may be taken into the human body with their vitality unimpaired and give rise to sickness. Epidemics of typhoid fever have been definitely traced to "floated" oysters which were undoubtedly innocuous when taken from the salter water.

It will thus be seen that this feature of oyster growing is not commendable, and is necessarily prejudicial to the best interests of the industry. The growth of the practice has been due to the ignorance of the public; its continuance after its undesirable nature has frequently been shown is a sad commentary on our intelligence.

OYSTERS ON THE PACIFIC COAST

While the entire east coast of North America has but a single species of oyster, the Pacific coast has five or six native species, and has been further enriched by the one from the Atlantic.

The most abundant of the native species, found in all the Pacific States, is very small and has a strong flavor. It is never served on the half shell, but is eaten in bulk, one hundred or more oysters often being a "portion" for one person. The largest and best occur in Willapa Bay, Washington.

Photo from Dr. Hugh M. Smith

OYSTERS GROWING ON A BOOT

During the past 40 years immense quantities of Atlantic oysters have been transplanted to the Pacific coast, and a large business has sprung up which surpasses that in the natives.* It is necessary, however, to renew the supply annually, particularly in Oregon and Washington, where the water is of too low a temperature to permit the eggs of the transplanted oysters to develop. This difficulty may eventually be overcome, and an oyster fully equal to that of the Atlantic be produced, by the acclimatization from the coast of Japan of a large oyster that is able to spawn in relatively cold water. Experiments to this end have been undertaken with promising results.

In the warmer water of San Francisco Bay the conditions for oyster culture are different, and there a very extensive and peculiar kind of oyster farming has sprung up. The grounds are surrounded by stockades, principally for the purpose of protecting the beds from the inroads of strong-jawed sting-rays, which at times enter San Francisco Bay in schools, and would crush and devour large quantities of marketable oysters unless excluded by the stockades. Within the inclosures the planting, transplanting, growing, gathering, and culling are done under ideal conditions.

A large oyster, similar to our Atlantic species, grows in great abundance in the Gulf of California, and is eaten in limited quantities in the adjacent parts of

* See National Geographic Magazine, June, 1907, for a fuller account of the transplanting of Eastern oysters on the Western seaboard.

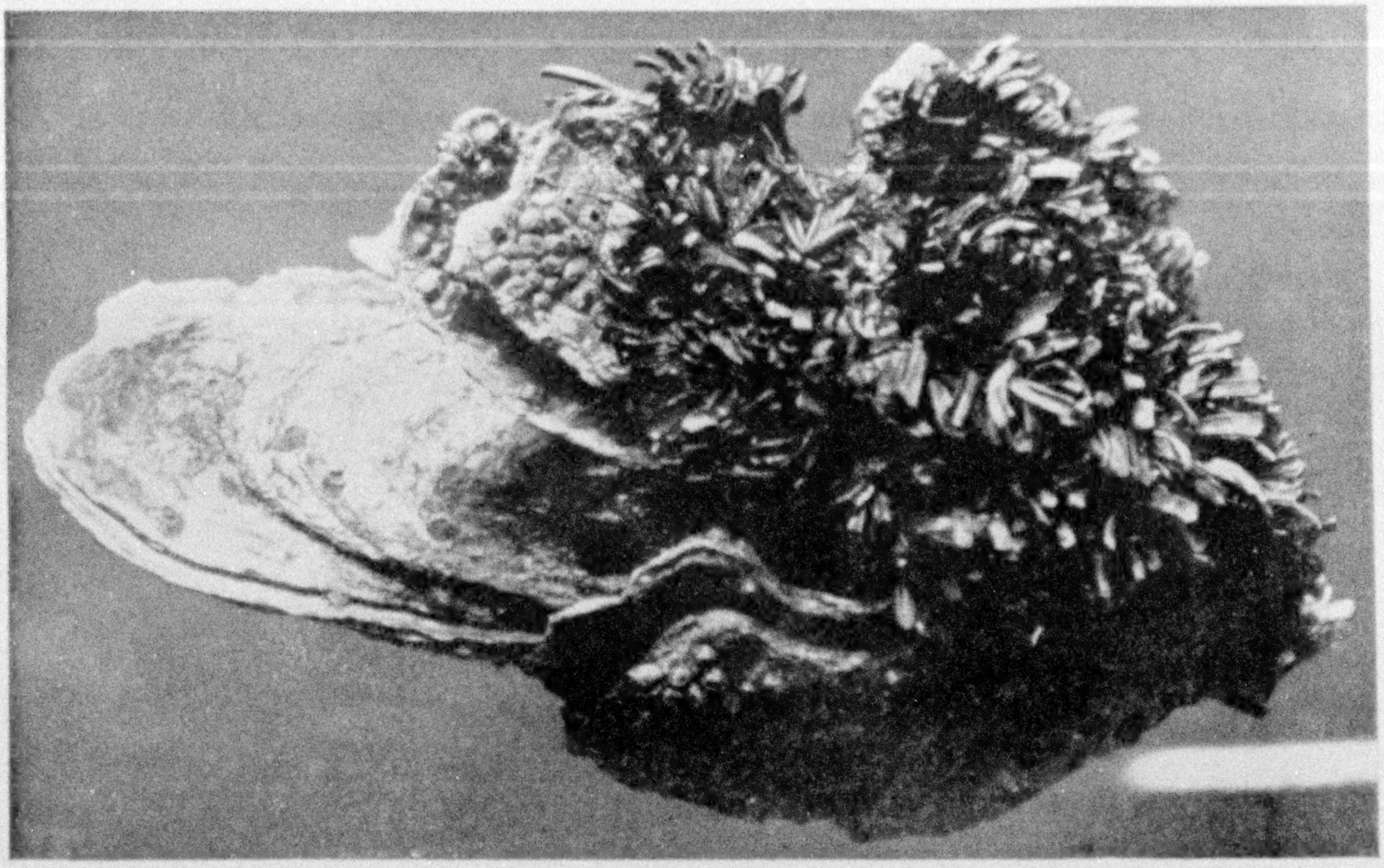


Photo from Dr. Hugh M. Smith

OYSTERS ENCUMBERED WITH A MASS OF EGGS OF THE WHELK

When the eggs hatch, the young whelks will devour young oysters by boring through the shell

Mexico. The grounds are virgin, and are capable of supporting a large industry.

HOW OUR GOVERNMENT AIDS THE OYSTER FARMERS

The Federal government, as represented by the Bureau of Fisheries, does not hatch oysters artificially and distribute them by the billion for the stocking of public and private waters as it does food fishes. A much more potent way to increase the oyster supply is the one that has been followed for many years, to the entire satisfaction of the oyster-growing communities.

This consists in practical aid to the States and coöperation with them in determining the physical and biological characters of the oyster grounds, in surveying and plotting those grounds with a view to their allotment for oyster culture, in conducting experimental and model planting operations, in recommending oyster legislation, and in giving disinterested expert advice on the various problems that arise in the development and administration of the oyster fishery.

Assistance of this kind has been rendered to every coastal State, and official requests for additional aid have of late been so numerous that the facilities of the Bureau of Fisheries have been overtaxed with respect to both funds and trained men for the work. The most recent surveys, experiments, and inquiries have been in Delaware, Maryland, Virginia, Alabama, Mississippi, Louisiana, and Texas, in several of which States the Bureau of Fisheries and the Coast and Geodetic Survey have joined forces in the accomplishment of special plans.

The beneficial results of the government's efforts in behalf of the oyster industry of the various States have been conspicuous and lasting. The recent remarkable increase of the oyster output in the Gulf States is directly attributable to those efforts.

Especially noteworthy has been the outcome of certain experimental planting operations in Louisiana. In Barataria Bay, where there had previously been no oyster industry, experimental beds laid out by experts of the Bureau

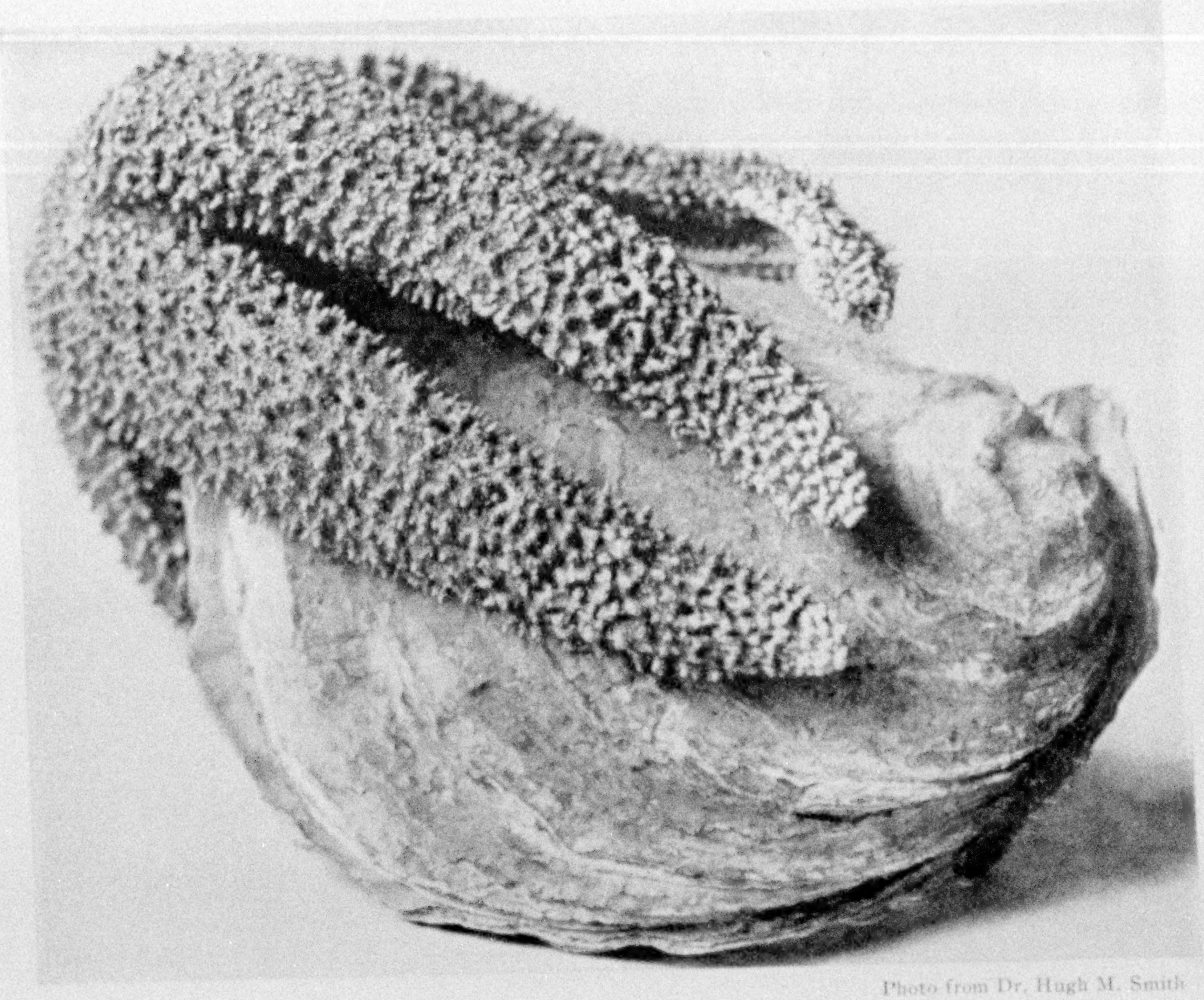


Photo from Dr. Hugh M. Smith

STARFISH ATTACKING AN OYSTER

"It is remarkable that a weak creature like the common starfish should be able to prey on an animal so strongly fortified as an oyster. The starfish acts by attaching itself to the lips of the oyster-shell and exerting a steady and long-sustained traction with each of its numerous small suckers. After a time the powerful adductor muscle of the oyster becomes fatigued, the valves open, and the starfish inserts its stomach and devours the helpless oyster at leisure" (see text, pages 260, 261).

of Fisheries yielded marketable oysters at the extraordinary rate of 1,500 to 2,000 bushels per acre in two years from the time the cultch was deposited on barren bottom. The natural consequence has been that all available oyster-growing land has been leased by the State, and a great impetus has been given to oyster culture.

The oysters thus produced on bottoms never before utilized are of high quality and meet with ready sale in New Orleans, where the "raccoon" and other oysters from the natural beds can hardly be sold at one-fourth the price.

In further pursuance of its paternal policy of promoting the oyster industry, the Bureau of Fisheries has sought to make known to fishermen, State officials, and legislatures the methods and conditions of oyster fishing and oyster culture in all parts of the world. To this end inquiries have been made in all foreign countries having important oyster resources. Special reports thereon have been issued and distributed broadcast, and, so far as its powers and facilities have permitted, the government has applied the knowledge gained abroad and at home to the particular requirements of the individual States in pointing out the way for the most successful utilization of the oyster grounds.

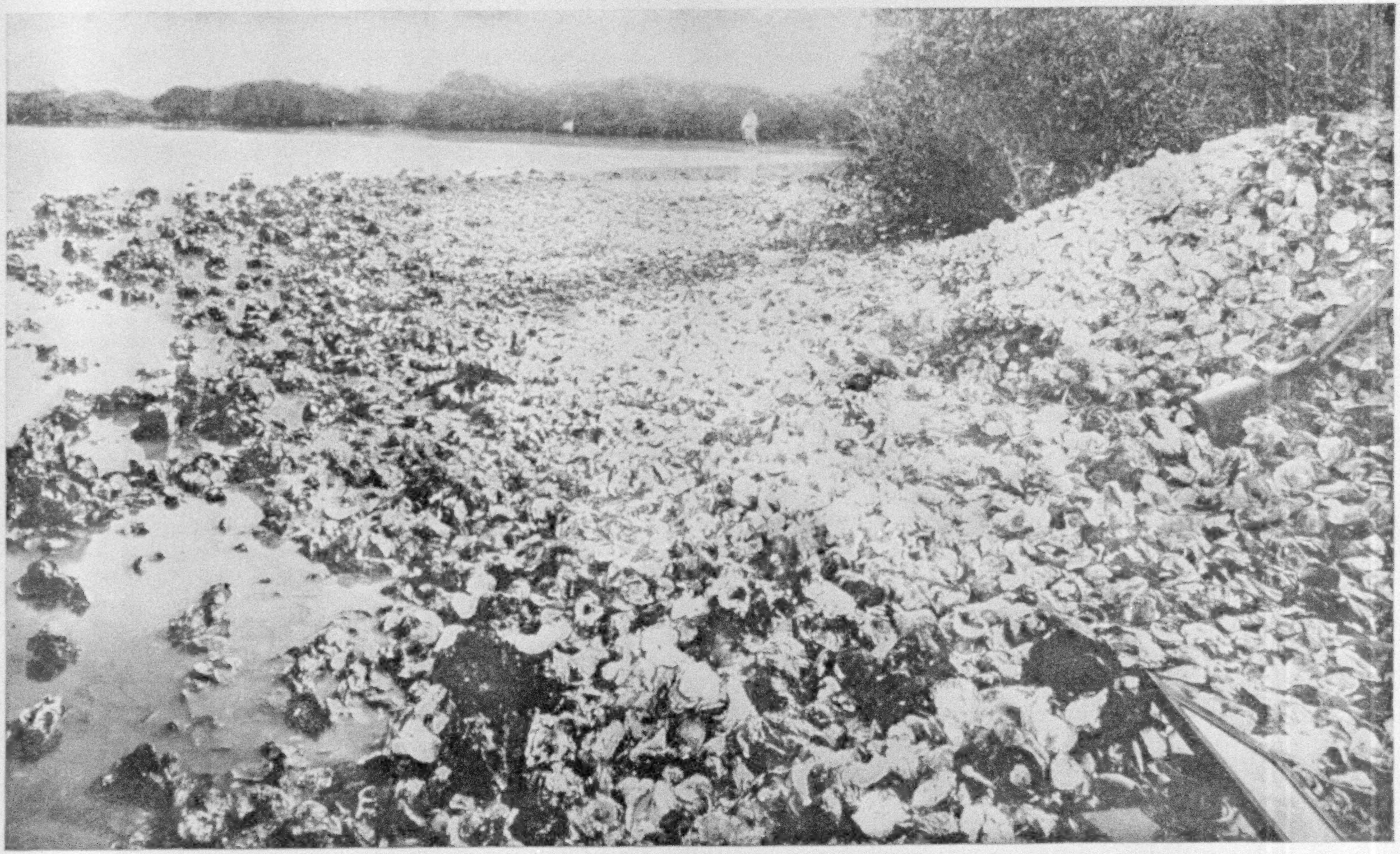


Photo from Dr. Hugh M. Smith

A NATURAL OYSTER REEF, MOUTH OF THE YAQUI RIVER, GULF OF CALIFORNIA, SHOWING DENSE GROWTH OF MISSHAPEN OYSTERS

THE FRENCH OYSTER INDUSTRY

France, which is the only rival of the United States in the oyster industry, has the distinction of maintaining the most perfect and thorough system of oyster culture in the world, although the methods pursued are not adapted to conditions in the United States or even in some countries contiguous to France.

The native oyster of France is the same species that occurs in England, Holland, and other countries of northwestern Europe. There is another species, however, which has been introduced into France and elsewhere, and has become very important on account of its hardiness, prolificness, and rapid growth; this is the Portuguese oyster, which in spawning habits and other characters is related to the American oyster, but is inferior in quality.

Oysters are cultivated along the entire coast of France.

For the handling of the native oysters the great centers of the industry are Cancale, on the north coast, and the districts of Auray, Sables-d'Olonne, Ile de Ré, Ile d'Oléron, Marennes, and Arcachon, on the Bay of Biscay. Cultivation of the Portuguese oyster is most extensive in the last four of the localities just mentioned, and, in addition, at Rochelle and Rochefort.

The number of oyster-cultural establishments in some sections is so large as to suggest that practically the entire shore-line must be occupied by parcs, claires, and viviers, as the various enclosures are called. Thus in the Marennes district there were in 1907 over 11,300 independent establishments for growing the native oysters and 5,400 for the Portuguese oysters. According to 1907 statistics, issued by the French government, 21,900 oyster farms, with a superficial area of 6,860 hectares, were devoted to the growing of the indigenous species, and 20,500 others, having an area of 5,150 hectares, were concerned with the introduced Portuguese oyster.

Oyster culture in France is of comparatively recent origin. Up to the middle of the last century the natural oyster banks were, like those of the Chesapeake, deemed inexhaustible, and dredging operations thereon were practically unrestricted. Then the government awoke to the gravity of the situation, and by stringent regulations endeavored to save the few remaining oysters.

The leading advocate and exponent of the possibilities of oyster culture was Professor Coste, who, after investigation and successful experimentation, made a report which embodied a proposition to restore the oyster banks of the entire coast. Obtaining a government grant through the interest of Napoleon III, Coste began extensive experiments, but was unfortunate in his choice of sites, met with unfavorable weather conditions, and failed in his entire undertaking, and he died blind, in disgrace, and regarded as a charlatan. Nevertheless, Coste's work was of the utmost importance, and it was his pioneer efforts that were directly responsible for the present advanced status of the French oyster industry.

Oyster culture in France has several distinct phases or branches in which the culturists specialize. The tidal oscillation leaves extensive flats exposed or nearly exposed twice daily, and this greatly facilitates the various procedures, the work being done in a horizontal plane, whereas in Italy and other countries where the tidal movement is slight the cultural operations are conducted under water and in a vertical plane.

The first essential step in the French method is to arrange on the shores, between high and low water, series of earthen tiles or wooden trays coated with lime cement, on which the floating oyster fry are collected. When the young have reached the size of a finger nail, usually by October, they are detached from the collectors by means of a short knife, the plaster being easily separated from the tile or wood. This work is done by women, who become very skillful in handling the thin-shelled seed oysters, of which as many as 20,000 or more may be detached by a woman in a day.

The young are then placed in wire gauze baskets and transferred to enclosed ponds or parcs, where growth may take place without danger from nat-

Photo from Dr. Hugh M. Smith

EXPOSED BED OF TRANSPLANTED EASTERN OYSTERS IN SAN FRANCISCO BAY

"The most abundant of the native species, found in all the Pacific States, is very small and has a strong flavor. It is never served on the half shell, but is eaten in bulk, 100 or more oysters often being a 'portion' for one person. . . . During the past 40 years immense quantities of Atlantic oysters have been transplanted to the Pacific coast, and a large business has sprung up which surpasses that in the natives" (see text, pages 264 and 265).

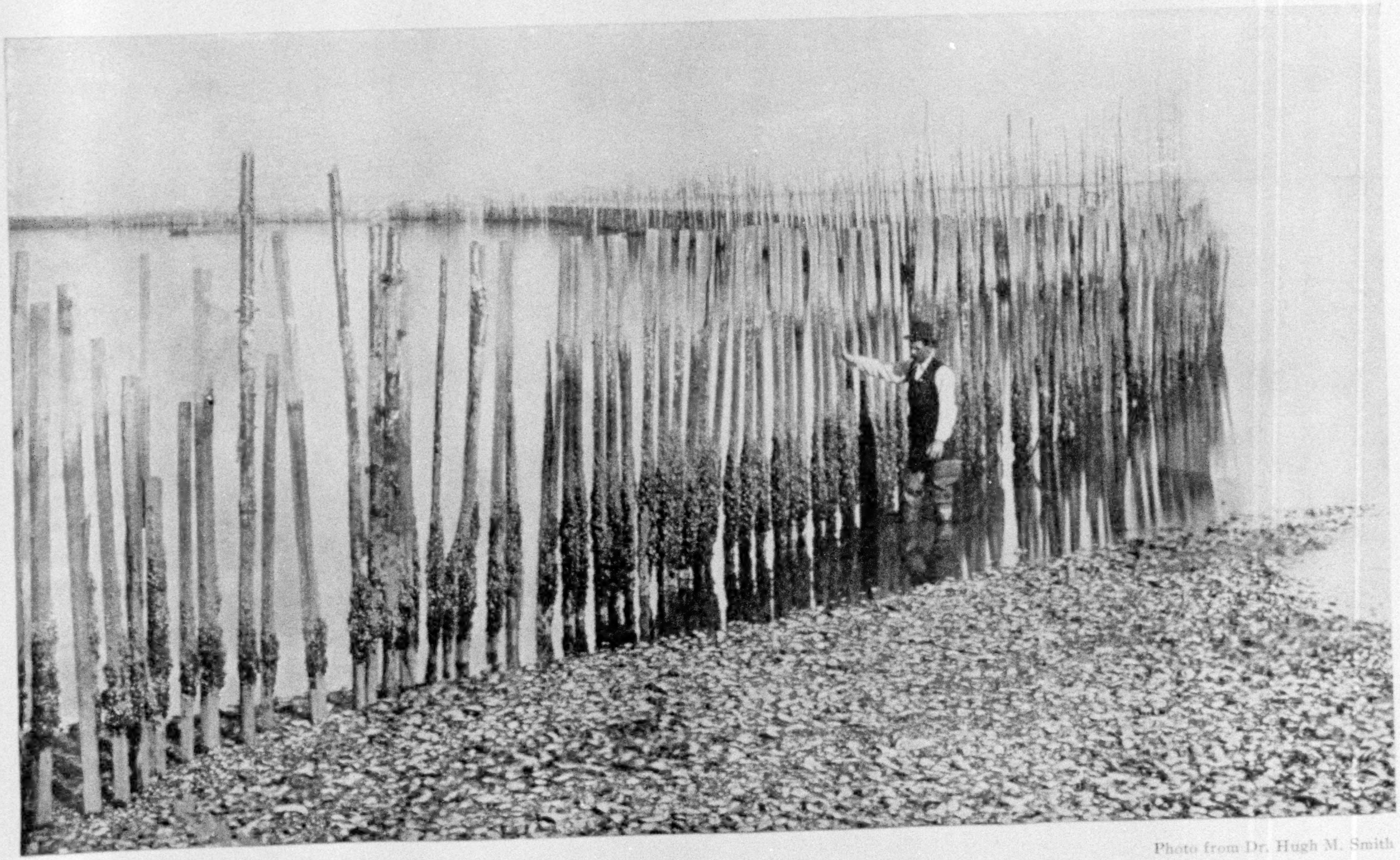
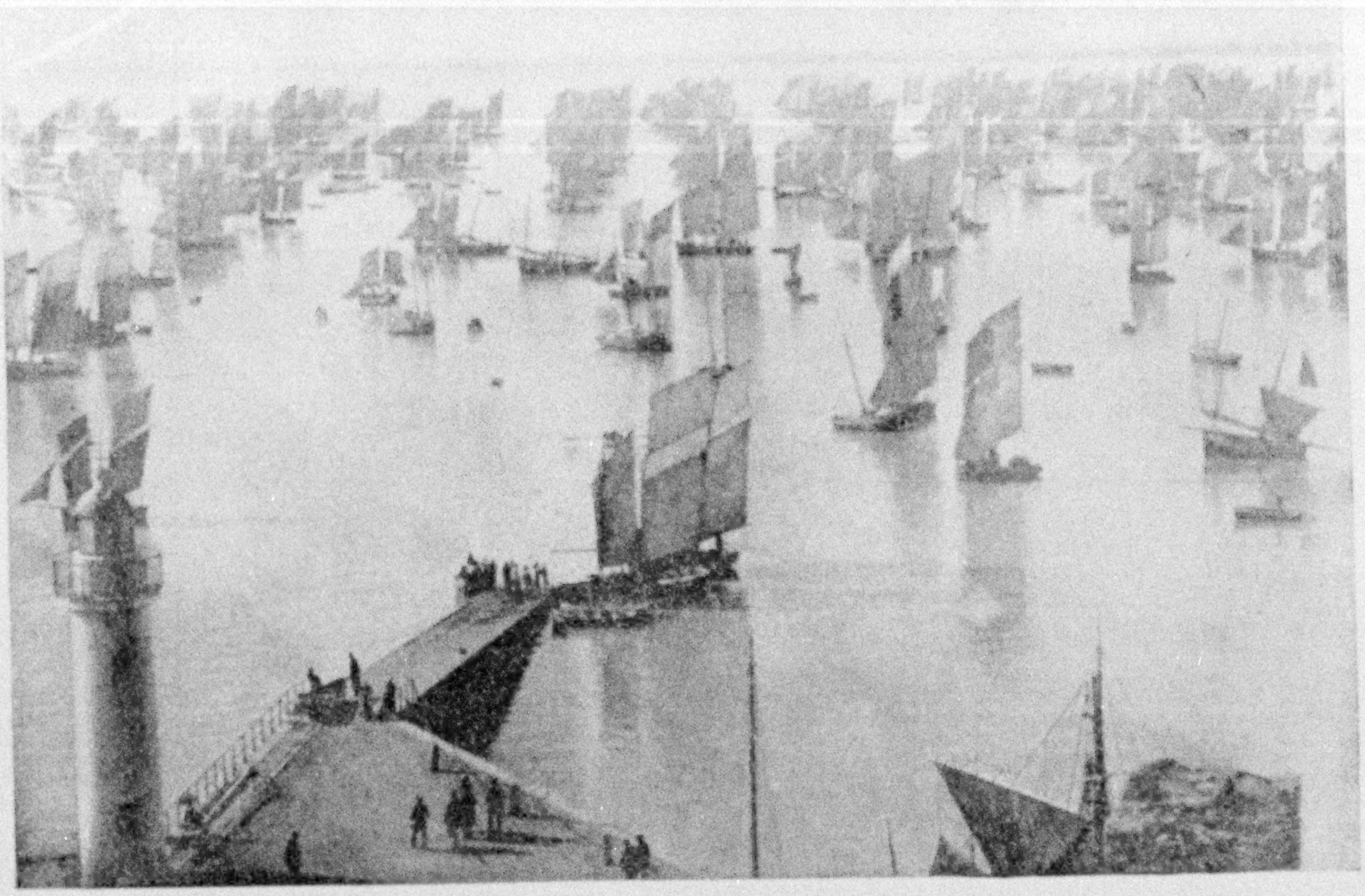


Photo from Dr. Hugh M. Smith

AN OYSTER STOCKADE IN SAN FRANCISCO BAY

"The grounds are surrounded by stockades, principally for the purpose of protecting the beds from the inroads of strong-jawed sting-rays, which at times enter San Francisco Bay in schools, and would crush and devour large quantities of marketable oysters unless excluded by the stockades. Within the inclosures the planting, transplanting, growing, gathering, and culling are done under ideal conditions" (see text, page 265).

XUM



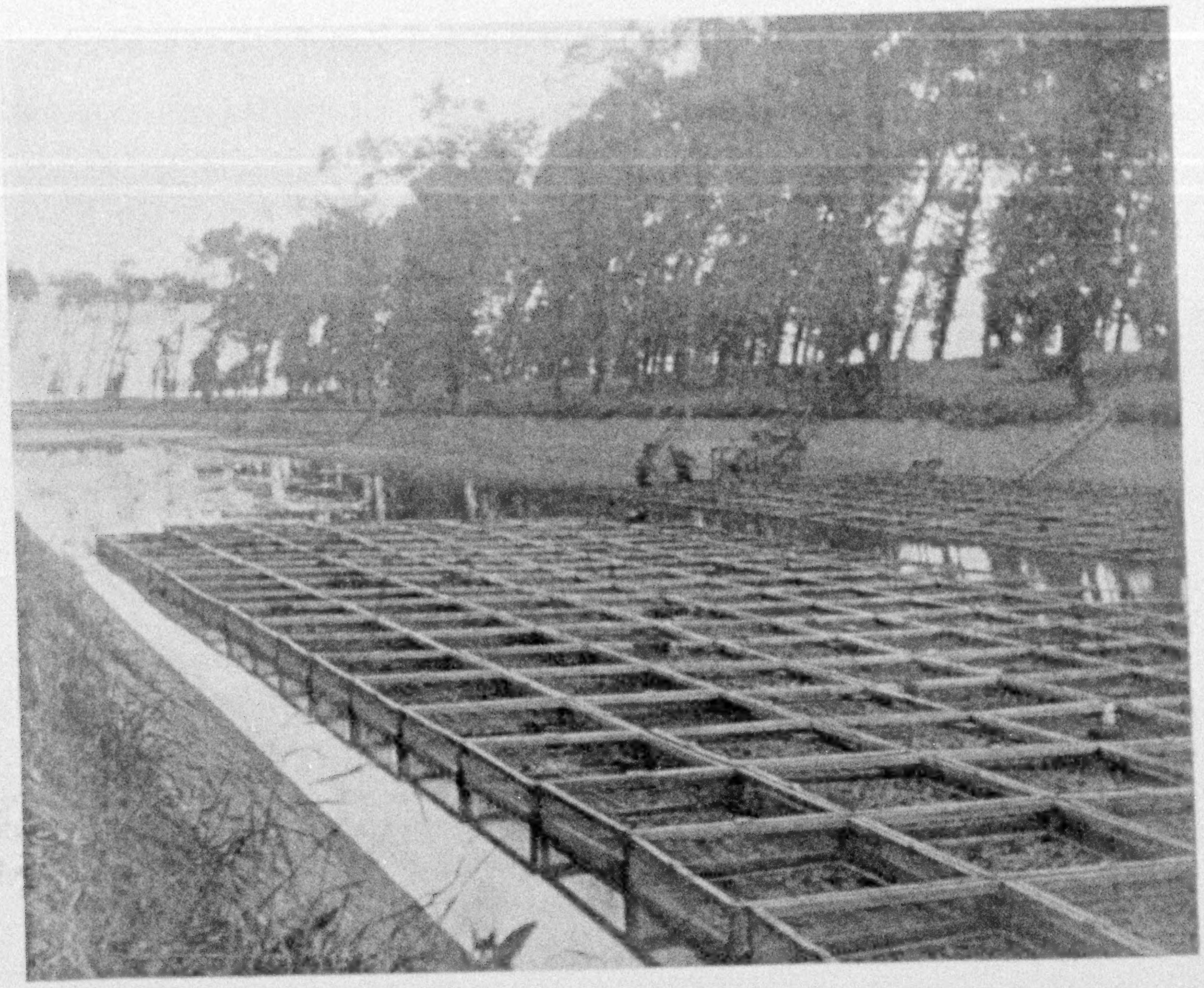
THE OYSTER FLEET AT CANCALE, FRANCE

Cancale is situated in Brittany, not far from St. Malo. During the summer months it is frequented for sea bathing; but the wealth of the little town depends upon its oysters, for which it is famous.

ural enemies or from suffocation by mud, sand, or silt. For two to three years the oysters are thus protected, requiring frequent overhauling, thinning out, and transfer to other parcs or baskets as their size increases, this part of the work also being done by women, clad in short skirts and having heavy, square shoes on their bare feet. Another phase of cultivation is the placing of the oysters, now of marketable size, in special enclosures or claires where there is an abundance of food, so that they may become fat and plump before sale and also acquire the condition of greenness that the trade requires.

Green oysters in America are often regarded as diseased or unwholesome, and our oyster-growers strive to prevent their occurrence; but green oysters in France are in greatest demand. Marennes has long been celebrated for its oysters of a green or bluish-green color, and special efforts are there put forth to make the oysters take on the maximum intensity of color in the shortest time. The claires at Marennes swarm with the minute plants, whose color is imparted to the gills and mantle when the oysters consume them in excessive quantities. Marennes oysters command the highest price in the market because of their exquisite and inimitable flavor, which connoisseurs say is dependent on their green color.

French oyster-growers in 1907 produced upwards of 1,450,000,000 oysters, having a market value of 3¼ million dollars. In addition, there was a small product taken from bottoms laid bare at low tide, which were not under cultivation, and from deep-water public grounds. Over 22,000 men, women, and children were engaged in gathering such oysters, and their aggregate take was about 175 million oysters, for which they received less than one-tenth of a cent apiece, whereas the cultivated oysters brought nearly three times as much.



WIRE-GAUZE TRAYS FOR REARING OYSTERS: BELGIUM

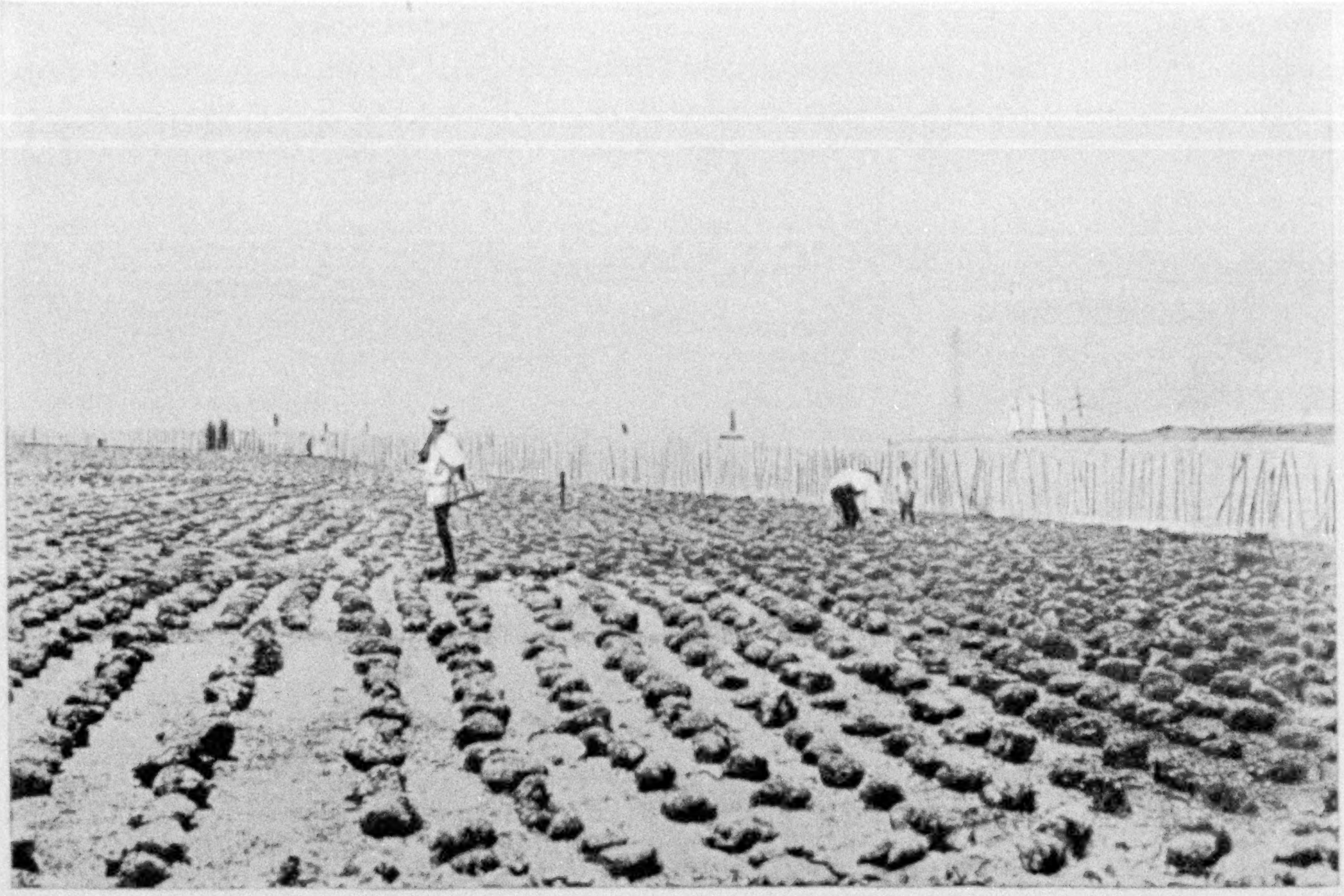
"The young are then placed in wire gauze baskets and transferred to inclosed ponds or parcs, where growth may take place without danger from natural enemies or from suffocation by mud, sand, or silt. For two to three years the oysters are thus protected, requiring frequent overhauling, thinning out, and transfer to other parcs or baskets as their size increases, this part of the work also being done by women, clad in short skirts and having heavy, square shoes on their bare feet" (see text, pages 269, 272).

ENGLAND'S ANCIENT OYSTER INDUSTRY

As early as the year 50 B. C. the fame of the British oyster had extended as far as Rome, and Sallust seems to have been more impressed by the oyster than by any other feature of the country, for he wrote: "The poor Britons—there is some good in them after all—they produce an oyster." In 80 A. D. oysters were exported from the Thames estuary to Rome, and ever since that time England has had an oyster industry of respectable proportions, although for many years the supply has been inadequate to fill London's gigantic maw, and importations from the United States, Holland, and France have been necessary.

In both quantity and quality the British product has been noteworthy from early times, and while the natural oyster grounds have been greatly depleted by excessive dredging the quality of the yield has not only been maintained, but has probably been increased by cultivation. To augment the supply of native oysters, seed is brought from America, France, Holland, and other European countries, and after being transplanted for variable periods is placed on the local market.

It is noteworthy that American oysters deteriorate when taken to England and placed on the grounds to grow and fatten; they grow rapidly, but the flavor becomes metallic and their creamy white color turns to leaden gray; furthermore, they will not reproduce. French seed oysters, on the other hand, when transplanted for three years in the English estuaries, take on the shape and flavor of the "natives," and are annually sold as such at great financial profit to growers and dealers.



OYSTER CULTURE IN FORMOSA

The soft muddy bottom all along the coast renders the cultivation of oysters a difficult matter. To obviate this natural disadvantage stones have to be laid in regular rows, to which the young oysters can attach themselves.

BIRTHPLACE OF OYSTER CULTURE

Although Italy was the birthplace of modern oyster culture in Europe and in early times had a large oyster trade, at present the oyster is not of great importance. Interest in the Italian oyster comes from its historic associations and the peculiar methods of culture which have been practiced with little change for 2,000 years.

The cardinal feature of oyster culture here is the keeping of oysters suspended between the bottom and the surface. To this end the spat is collected on bundles of twigs hanging from ropes stretched between the stakes at the corners of the squares; the brush, with the oysters attached, is woven into huge ropes, 10 to 20 feet long, which when suspended utilize the entire volume of water, and the oysters that become detached and the full-grown ones are placed for final growth, fattening, and storage in suspended baskets. It is reported that on a rope 14 feet long about 2,000 marketable oysters may be reared.

OYSTERS IN OTHER EUROPEAN COUNTRIES

Holland has a rather extensive industry, which ranks after that of France among the continental countries. The natural oyster grounds were practically wiped out by overdredging, and the institution of artificial measures has been so wisely undertaken by both government and private citizens that the Dutch have come to be regarded as the most successful administrators of the oyster industry. Efforts to restore the depleted grounds in the Zuyder Zee have been futile, and the industry now centers in the Schelde estuary, in Zeeland. The bottoms suitable for oyster culture have been carefully surveyed and plotted, and the government receives a large revenue from their lease. Zeeland oysters are in great demand in Holland, and are also shipped to England and other countries

LOW TIDE ON A JAPANESE OYSTER FARM

"Owing to a rise and fall of the tide of from 10 to 15 feet, an immense area of bottom suitable for oyster growing is exposed twice daily, and the cultural operations are thus conducted under conditions that do not exist in America or various other countries" (see p. 281).

for immediate consumption or for transplanting.

The oyster grounds of Germany are restricted to a small section of the coast of the North Sea near the Danish frontier. The banks have for three centuries been the property of the Crown, and are leased for terms of years. The government exercises strict supervision, to prevent the depletion of the natural beds and at the same time to induce the maximum production therefrom.

The oyster industry of Belgium centers at Ostend, where claires or reservoirs for fattening oysters have been in constant use for more than a century. The Belgium oysters are highly esteemed for their flavor, and Ostend is one of the great oyster depots of Europe. The physical conditions on the Belgium coast are not favorable for general oyster culture, and the industry consists for the most part in fattening and conditioning oysters from other countries. Foreign oysters transplanted in the Ostend reservoirs for a short time acquire a new flavor, and are then sold at home and abroad as "Ostends."

Denmark has an interesting oyster industry, restricted to the Limfjord, an irregular arm of the sea that extends entirely across Jutland. The oysters are the property of the Crown, and the privilege of taking them is now sold to the highest bidder, who enjoys a monopoly, with restrictions imposed by the government fixing the annual output and the maximum price that may be charged. The Limfjord oysters are nearly circular in outline and have large, plump meat of excellent flavor. No form of cultivation has ever been applied, and the supply is maintained by limiting the production. The oysters are gathered by means of steam vessels, using dredges, six of which are hauled simultaneously.

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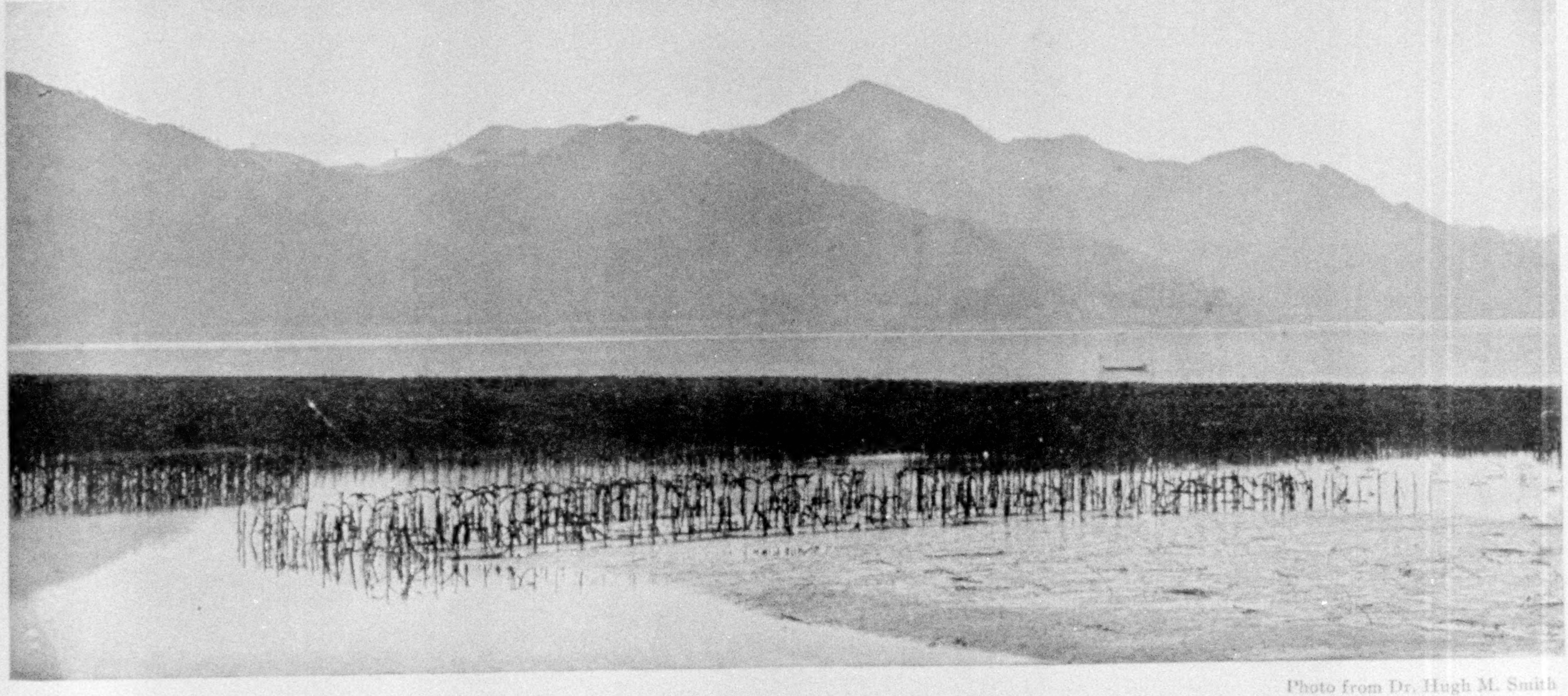
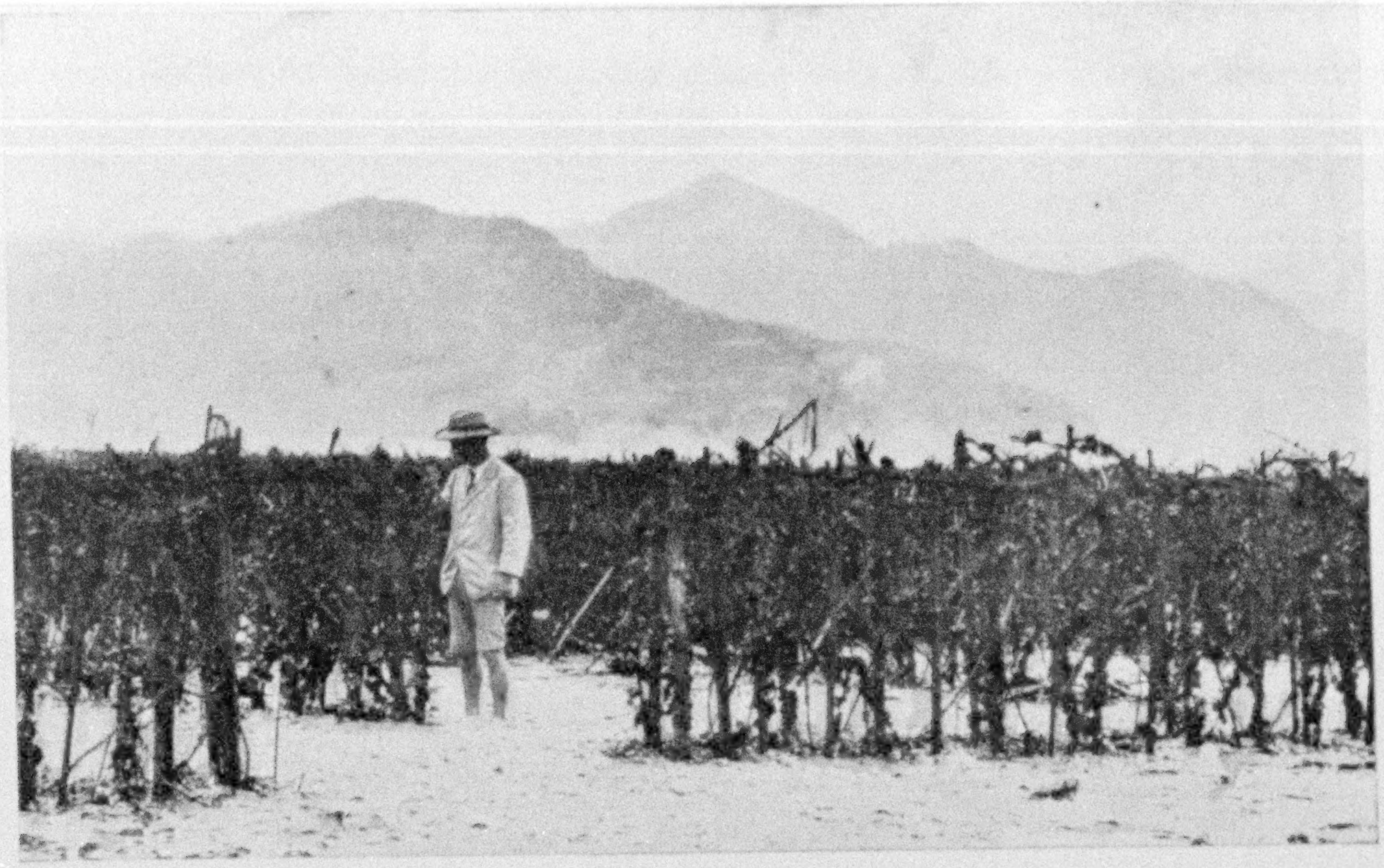


Photo from Dr. Hugh M. Smith

AN OYSTER FARM IN THE INLAND SEA: JAPAN

"The individual Japanese oyster farms are of comparatively small size and are separated from one another by bamboo fences or hedges. When viewed from a distance at low tide, the exposed bottom and the innumerable upright pieces of regularly arranged bamboo strongly suggest an agricultural rather than an aquicultural crop" (see text, page 281).



INSPECTING A JAPANESE OYSTER CROP

The great rise and fall of the tides in Japan is of considerable advantage to the oyster farmer, enabling him to keep his crop under direct observation during the entire period of growth.

IN THE SOUTHERN HEMISPHERE

The oyster resources of the lands south of the Equator are comparatively unimportant. In South America and South Africa efforts at cultivation are under way, but the most promising field is Australia. The oyster industry has attained some proportions in all the Australian States, but New South Wales surpasses all the others combined. Under a system of leases, several thousand oyster planters have been granted littoral and deep-water grounds, and the foreshores already taken up are nearly 400 miles in length. The oysters grown under the peculiar conditions prevailing are of excellent quality and have an average value to the producer of more than $3 a bushel.

JAPAN'S CURIOUS METHODS OF CULTURE

The oyster industry of Japan is not of great importance in itself, the aggregate output being valued at less than a quarter of a million dollars; but it is of interest because of the cultural methods adopted and the possibility of establishing and cultivating Japanese oysters on the Pacific coast of the United States.

Oysters of several species are widely distributed in Japan, but the business of growing and marketing oysters attains its greatest development in the famous Inland Sea, near the large city of Hiroshima. At least as early as 1720, and probably much earlier, the growing of oysters by artificial means was understood and practiced there, and long before the descendants of Mayflower pilgrims had realized the desirability of and the necessity for oyster culture, the Japanese had grasped the situation and made provision for an enlightened administration and utilization of oyster grounds, such as some American States have not yet come to appreciate.

The Japanese are so original in their aquicultural practices that their peculiar and effective style of oyster farming need occasion no surprise. Some experts have pronounced their methods the simplest and most practicable of all, and

Photo from Dr. Hugh M. Smith

LOW TIDE IN A JAPANESE OYSTER PARK: INLAND SEA

"The distinctive feature of Japanese oyster culture is that the very young oysters are not allowed to settle on shells or other forms of cultch commercially employed in America, but are collected on bamboo stalks to which the branches and leaves are attached" (see text, page 281).

WHAT A JAPANESE OYSTER FARM LOOKS LIKE

This is a general view of a Japanese oyster park near Nihojima, Inland Sea. The piles of bamboo brush have been newly arranged for the beginning of a new season's work. At high tide this ground is submerged to a depth of 15 feet

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GATHERING OYSTERS IN A JAPANESE OYSTER PARK

"Prior to the spawning season, each oyster grower sets out an immense number of prepared bamboo stalks; these are thrust deeply into the soft bottom, and are arranged in definite lines or groups so as to intercept the floating spat. After remaining attached to the bamboo brush for one to two years, the oysters are planted on prepared bottoms, where growth and fattening are completed. The oysters are marketed when two to three years old" (see text, page 281).

it behooves western countries to become acquainted with those methods even if there is no opportunity for their adoption in their entirety.

Owing to a rise and fall of the tide of from 10 to 15 feet, an immense area of bottom suitable for oyster growing is exposed twice daily, and the cultural operations are thus conducted under conditions that do not exist in America or various other countries.

The distinctive feature of Japanese oyster culture is that the very young oysters are not allowed to settle on shells or other forms of cultch commercially employed in America, but are collected on bamboo stalks to which the branches and leaves are attached. Prior to the spawning season, each oyster grower sets out an immense number of prepared bamboo stalks; these are thrust deeply into the soft bottom, and are arranged in definite lines or groups so as to intercept the floating spat. After remaining attached to the bamboo brush for one to two years, the oysters are planted on prepared bottoms, where growth and fattening are completed. The oysters are marketed when two to three years old.

The individual Japanese oyster farms are of comparatively small size and are separated from one another by bamboo fences or hedges. When viewed from a distance at low tide, the exposed bottom and the innumerable upright pieces of regularly arranged bamboo strongly suggest an agricultural rather than an aquicultural crop.

GREECE AND MONTENEGRO

By George Higgins Moses

U. S. Minister to Greece and Montenegro, 1909–1912

OF THE four allied Balkan States who have made history so rapidly in the past few months, two—Bulgaria and Servia—are contiguous; and two—Greece and Montenegro—are isolated; isolated not only from each other and from their allies, but isolated practically from the rest of the world.

Like a clenched hand thrust down from the sturdy arm of the Balkan Peninsula, Greece, blocked, hitherto, from direct communication with that portion of the world which its people so curiously insist upon calling "Europe," has made the sea its highway from classic days; while Montenegro, perched in the rocky fastnesses of grim Cernagora, both defies and invites invasion with its magnificent system of highways so delightfully easy of passage in time of peace and so superlatively simple of defense in time of war.

Behind the stern barrier of the Lovcen, towering 6,000 feet above the smiling waters of the Bocche di Cattaro, and crowned with the simple tomb of Peter II, the Montenegrin saint and lawgiver, who begged to be laid there that his spirit might survey the land he loved so well, dwell the old Lion of Montenegro and his people—he the last of the patriarchs in this modern world and they a race of warriors whose origins lie back in those misty days ere the first faint swirl of the never-ceasing flood of Slavic blood had made its way southward to sweep across the valleys and the plains from the Black Sea to the Adriatic.

WHY THE MONTENEGRIN WEARS A BLACK HAT BAND

Thither, upon the final overthrow of the ancient glory of the Serb upon the fatal field of Kossovo—in memory of which to this day the Montenegrin's cap is banded with a rim of black—thither retreated a handful of valiant souls to seek asylum with the Voivode of the Zeta. A few years later, abandoned by their ruler—who preferred a life of ease at Venice—they turned to their bishop, made him also their prince, and with him retreated still deeper into the hills and

there set up that long line of the Vladikas which did not end until well into the last century.

There for 500 years they have maintained freedom, which "of old has sat upon the heights"; and, with sufferings indescribable, with courage illimitable, won from the great English apostle of Balkan freedom those words of undying praise, in which he gave it as his "deliberate opinion" that "the traditions of Montenegro exceed in glory those of Marathon and Thermopylæ and all the war traditions of the world"; and inspired in Tennyson what he regarded as the finest of his sonnets, inscribed to the

". . . smallest among peoples! rough rock-throne
Of freedom! warriors beating back the swarm
Of Turkish Islam for 500 years,
Great Cernagora! never since thine own
Black ridges drew the cloud and broke the storm
Has breathed a race of mightier mountaineers."

Ascending the marvelous zigzag road which leads up from Cattaro, one approaches the stern and gloomy defile which forms the portal to this historic stronghold of freedom in the Balkans.

A WONDERFUL ROAD

Splendid engineering is this road. Built for post and military uses, it clings to the face of the sheer rock and weaves back and forth in a multitude of "hairpin curves" which the chauffeurs of the post automobile treat with that contempt which familiarity alone can breed.

Up and ever up, one goes. Below stand forth the dusky cliffs, which jut into the southern fiord; nestling beneath them, and hemmed in with the massive battlements of those giants of an earlier day who stretched out the lion of St. Mark's from the Lido to the Bosporus, lies Cattaro—Italian in appearance, Austrian in allegiance, but Serb in feeling, its heart ever in the Highlands. Beyond smiles the Adriatic, and above tower the gaunt gray rocks, against which the road seems a veritable ladder laid upon a wall.

Threading at last a narrow defile, whose walls are pierced with caves where lurk the fables of the mountaineers, and crossing a pass too often swathed in clouds, one turns a corner and comes face to face with the ancient realm of the Vladikas.

The smile of the soft blue sea lies behind, and before stretches a wild, turbulent ocean of rock, rising and sinking in angry gray waves flecked with white, which seem to leap and rage and battle together like a sea lashed by a storm. Stones, rocks, and crags, nothing else; not a tree, not a blade of grass; scarcely even a tuft of brushwood to relieve the dreary scene of desolation.

At the creation, so runs the Montenegrin legend, an angel was sent forth to pick up the superfluous stones on the earth's surface. He placed them in a bag, which burst as he was flying over Cernagora—and certainly the landscape bears out the tale.

And yet the scene cannot be said to lack charm—the charm of majesty always to be found among the hills. And while Cernagora at first sight—gaunt, gray, and drear, an arid wilderness of bare rock—tells in one blow of the sufferings of centuries, pity does not long endure; it passes almost at once to praise for a people who have preferred liberty in this desolation to slavery in fat lands.

THE CRADLE OF THE ROYAL HOUSE

From the Austrian border to Cetinje one encounters but one village, Niegush, nestling in a little cleft in the hills and claiming attention as the cradle of the Petrovich dynasty, which for more than two centuries has ruled the destinies of the land. Here was born not only Danilo I, progenitor of the line, but most of his successors, including the present king, whose tiny villa is the show-place of the town.

Founded more than four hundred years ago by a band of refugees from the Herzegovina, Niegush cherishes the curious legend that one of its sons, wandering even farther afield, found himself one day in Abyssinia, where he became possessed of power and transmitted to his successors the title of Negus, in memory of his Montenegrin birthplace.

Here we halt for the customs examination—a formality which is soon over, even for those who do not possess a

Photo from Katrice Nicolson

A MONTENEGRIN IN THE DOORWAY OF HIS HOME

diplomatic *laisser passer*—and after refreshing ourselves with a coffee at the Grand Hotel, which the town possesses in common with every other in Europe, we begin the ascent from the pocket of Niegush, and an hour's climbing brings us to the top of the pass, and we behold Cetinje.

WHERE THE CONQUERING TURK HAS NEVER TROD

The distance as the crow flies is short; but the winding road multiplies the miles, and we have ample opportunity to survey the tiny capital which boasts itself—albeit somewhat inaccurately — that its

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Photo from Katrice Nicolson

TWO MONTENEGRIN OFFICERS IN NATIONAL COSTUME

Note the double eagle over the door bearing the royal cipher (N. I.) of Nicholas I

Photo from Katrice Nicolson

SOME OF THE MONTENEGRIN VETERANS OF 1860

streets alone of all the Balkan capitals have never echoed to the tread of a conquering Turkish host.

Two broad, parallel streets, connected by irregularly laid out cross streets, comprise the town, which lies hemmed in on every side by the stern hills. The green fields, the elms, the buttercups by the roadside, and the steep gables of the houses, which often lie banked to their eaves with winter's snows, reminded me always of my own White Mountain villages—an impression which was indelibly fixed in my mind on the first morning that I ever saw Cetinje.

I had reached the capital late on a Saturday evening. The next day was set for the inauguration of the new National Theater, and the people were out in force to cheer their ruler as he went from the palace. The hotel at Cetinje stands at the head of the main street, which was filled with Montenegrins in national garb, and as I stepped upon the balcony after my coffee and looked down upon the throng of red-jacketed mountaineers, I thought for all the world that I was in some New England hill town on the day of a firemen's muster.

European dress has made slight inroads in this part of the world. The army now, thanks to Russian generosity, wears khaki; but the guard of honor which accompanied me to the palace when I presented my letters of credence were in Montenegrin garb, and the palace attendants still wear it. It is the habitual dress of both King and Queen, the latter having pointedly refused the suggestion of her daughters-in-law that, together with the royal title, she should take on modern gowns.

COSTLY HIS HABIT AS HIS PURSE CAN BUY

A Montenegrin's habit is as costly as his purse can buy, and there the apparel proclaims the man. The baggy blue trousers are the same for the King or the peasant, as is the gaily colored sash which holds the invariable revolver. But from the red jacket, whether it be embroidered with black or with gold, and from the redingote, whether it be of dark green or a delicate blue, one connotes whether the wearer be a man of substance and consequence or not.

Among the women there are slighter distinctions. All wear a simple dark skirt, a more or less elaborate blouse, and a redingote of blue, though for the peasants the outer garment is likely to be of a coarse woolen stuff of home manufacture.

Men and women alike wear the black-banded red cap, the crown embroidered for the women with some fanciful de-

Photo from Katrice Nicolson

AS EARLY AS SIX IN THE MORNING THE STREETS OF CETINJE WERE FILLED WITH GAYLY DRESSED PEOPLE

vice in gold, while the men proclaim their fealty to Nicholas I by ornamenting their caps with his cipher in Cyrillic characters surrounded by five semicircular rows of gold braid to typify the five centuries of Montenegrin independence. I can foresee, in 1984, unless the fashions in the Black Mountain have meantime changed, that a hatter's monopoly in Montenegro will be well worth having.

Montenegrins are nearly all giants and they stride as though each wore seven-league boots. Indeed, when a Montenegrin wants to go anywhere in a hurry he walks, not using the splendid roads with which his mountains are threaded, but taking the old short cuts among the hills.

A HUMAN TELEGRAM

Last spring, when Danilo the Crown Prince was hurriedly despatched to Paris to seek the aid of his brother-in-law, the Grand Duke Nicholas, for the conflict which has since ensued, an important document was found to have been left behind, and no automobile was at hand to send with it to Cattaro.

It was suggested to the King that one Michel, a runner of repute, was about the palace, and that perhaps he could overtake the Prince before his steamer had sailed. So the paper was given to Michel, and the King, who was giving a state luncheon that day, went to the dining-room. Passing through the corridor to his study after the meal, the King saw Michel sitting there and upbraided him for not having gone to Cattaro. "I have just come back, Gospodar," answered Michel. "Ah, then!" exclaimed the King, "you are Michel the Telegram." And Michel the Telegram he now is in Montenegrin speech.

These Montenegrins are a race of warriors, and for years they have sat about in the coffee-houses bemoaning their lot. "What a life for a man!" they have said. "Thirty years without a war; nothing for a man to do."

But there seems to be always plenty for the women to do, and the women of Montenegro, so alert and graceful in their youth, soon lose their good looks and become bent and bowed and ugly; for—but I will give it in the language of General Martinovitch, president of the council of ministers, minister for foreign affairs, and minister of war, and commander of the southern column of the Montenegrin army which has been operating against Scutari. Martinovitch was not always the Poo Bah that he now is, but at the time of which I speak he was minister of war and had arranged a review of troops in honor of the King of Italy, who was visiting his father-in-law.

WOMEN THE PRODUCERS

I dined at the palace that night and took occasion to compliment the minister on the appearance of the soldiers. I asked how many were his effective strength and he said that he could put 50,000 men in the field. I expressed incredulity and said that that number would be one-fifth of all the people in the kingdom—more, I added, than could be spared from the productive pursuits. "Productive pursuits, indeed!" cried Martinovitch. "Don't you know that the women do all the work up here anyway?"

And yet the Montenegrin is a man of capacity and when taken from his bellicose environment of his mountain home becomes one of the best of workers.

In our own Northwest there have been many of them in the mines where they toil industriously as against that day when, with the 10,000 crowns which will make them rich, they may return to their beloved Black Mountain.

His 500 years of freedom have given the Montenegrin a fine sense of order, and it is a current saying along the Dalmatian coast that when a Montenegrin applying for a job is asked what he can do he invariably answers, "Superintend."

The externals of Montenegrin life are simple. In Cetinje there are but two buildings of three stories, and neither of them is the palace; they are the legations of Austria and Russia, whose rivalry in the Near East extends, it would seem, even to the housing of their representatives.

The palace is an unpretentious structure, built some 60 years ago, and, though the famous plane tree before its door beneath which King Nicholas for so many

Photo from Katrice Nicolson

A GROUP OF MONTENEGRIN BOYS

Note the military salute, a sign of the early appearance of the warlike spirit in these unconquered mountaineers

years dispensed a quick and shrewd justice to his people has disappeared, the master of the house remains the same father to his people that he always has been.

THE DEMOCRATIC KING

Access to him, now that he has become a King, is slightly more difficult than in the olden days; but every afternoon he may be seen driving about the streets of Cetinje in a low phaeton, the Queen or one of the princesses with him, and frequently he stops to exchange greetings with one of his intimates or to give to one of his people that highest of all Montenegrin privileges—that of kissing the sovereign's hand.

Wherever he goes he finds the evidences of his rule. As I have said, all Montenegrins bear his cipher on their caps. The same initials, formed of captured Turkish cannon, stare out from the gable of the huge barracks of Cetinje; within sight of his study windows rears the bulk of the new government house which he has built; across the street are the guest house and the home of his second son; from his own garden he can stroll to that of the Crown Prince and thence to the public park which he has created.

Close to one of his gates stands the old *Billiardo*, whose name is shrouded in mystery; for none can declare with certainty whether it is because the building once had at its corners little towers which looked like the pockets of a billiard table, or because in one of its rooms was installed the first billiard table in the kingdom. In this little building Nicholas was voted his royal title, and there the Council of State has its apartments.

On another corner of the little Place du Palais is the long, low dormitory of the old monastery. In its upper rooms Danilo II taught his chiefs to read and write, while further on, at the base of a high hill, stands the monastery itself, the most interesting building in Montenegro, for here were made the desperate defenses against the Turks which have

Photo from Katrice Nicolson

SOME FELLOW-TRAVELERS IN MONTENEGRO

With their pistols in their belts, they were rather fierce looking, but they proved to have the kindest hearts possible

enriched the Montenegrin legend with so many tales of bravery.

A NATIONAL SHRINE

This venerated stronghold and sanctuary of faith and freedom in the Black Mountain stands on the spot where, in 1484, Ivan the Black established himself upon moving his seat of government from the shores of the Lake of Scutari to Cetinje, and where he established the first Slavonic printing press, whose four hundreth anniversary was celebrated with much rejoicing a few years ago. A century and a half later it succumbed to the Turks, but was soon retaken by the Montenegrins, who descended in force from the Lovcen, whither the invaders had been unable to follow them. Two centuries and a quarter ago it was blown up by the monks themselves, who perished with their precious books and documents rather than see their sacred walls again degraded by the Moslem foe.

But again and again the structure has raised its benignantly defiant front. In

Photo from Katrice Nicolson

PEASANTS IN CETINJE FOR A FETE DAY

Photo from Katrice Nicolson

WHEN PRINCE NICHOLAS BECAME KING NICHOLAS I THERE WAS GREAT REJOICING AMONG THE PEOPLE

its present appearance it dates only from the 18th century; but its quaint clock tower and shaded cloisters give it an impression of a much greater age.

Here rest many of the Vladikas; here are to be found the cannon captured from the foe on many an historic field; here is preserved a page from the first gospel issued from the famous press (whose type were afterward melted down to make bullets), and it is little wonder that the Montenegrin peasant making his way to market at Cetinje pauses as he glimpses the shrine from afar and crosses himself devoutly as he whispers a prayer for the Black Mountain and its Gospodar.

GRIM RELICS OF THE PAST

Above rises the Tower of the Skulls, the old-time citadel of the monkish defenders, which takes its name from the fact that up to within a short time it bore grisly fringes of Turkish heads impaled upon its ramparts. These grim reminders of a gory past were dear to Montenegrin veterans, and many were the murmurs of disapproval when the Gospodar concluded to remove them.

Life in Montenegro centers in the King, who is greater than the ministry, the chamber, or the constitution, who all owe their creation and preservation to his grace. More than any other sovereign of whom I know he fits his legend. Nicholas I, "King and Gospodar of free Cernagora and the Berda," is the most picturesque and remarkable figure in the southern Slavonic world, to say the least. Descended from a long line of heroes—the heir of the Vladikas—he has, like them, distinguished himself in many a hard-fought conflict.

As a lad he was with his father, Mirko, the "Sword of Montenegro," at fateful Grahovo, and like Mirko, too, he has written lyric odes and ballads. Like his ancestor, Peter II, he has composed historical dramas and given laws, and, like all his line, he has at all times displayed a courage and a capacity fitting every occasion.

THE NATION'S TYPE AND HERO

The inheritor of a splendid tradition, a warrior and a bard, gifted by nature with a fine physique and a commanding presence, he personifies and embodies all that appeals to the imagination of a romantic and impressionable people, to its martial instinct, its poetic temperament, and its yearning for long-vanished glories.

He is a statesman at once bold and cautious, a diplomatist of many talents,

Photo from Katrice Nicolson

PRINCE NICHOLAS AND PRINCESS MILENA GOING TO THE PALAIS DU GOUVERNEMENT TO BE PROCLAIMED KING AND QUEEN ON THE 50TH ANNIVERSARY OF HIS ACCESSION TO THE THRONE AND ON THE OCCASION OF HIS GOLDEN WEDDING

a capable administrator, and a thoughtful reformer. Again and again he has repressed the war-like ardor of his mountaineers, and has led them to battle only when no other course was possible.

But whether he has fought or remained tranquil he has always profited. Like his royal cousin at Sofia, Nicholas of Montenegro is a skillful international trader; and as I have seen him in stormy times negotiating now with the revolutionary Albanians and now with the Turks, I have often wondered if his intellectual inheritance was not as much of the White as of the Black Mountain.

He was but yet a boy when the assassin's bullet brought him to his uncle's place, to the place of that uncle who had launched the *nolo episcopari* at the heads of his astonished people, but whose marriage remaining childless has seen the crown pass in its usual succession from uncle to nephew, so that if Nicholas shall give place to Danilo it will be the first time in Montenegrin history that a son has followed a father upon the throne.

WHAT NICHOLAS HAS DONE FOR HIS LAND

Nicholas was then a little lacking of 19 years, but his education in Paris and his experiences at home had given him wisdom beyond his years, and his tiny land has profited by it mightily.

He has already doubled his territory, and now expects to gain much more. He has added two Adriatic ports to his possessions. He has organized ministries, the courts, finance, and all the departments of government. Where, when he came to the throne, only a few difficult trails threaded the hills, today a splendid network of roads connects all the principal points of the kingdom, and it may be said of Montenegro alone among nations, I hazard, that wherever one may go at all in a wheeled conveyance one may go in an automobile.

He has established posts and telegraphs, so that whereas once a Montenegrin mobilization was effected by stentorian hallooing from peak to peak, Cetinje is now constantly in touch with all parts of the country and with the outside world.

He has codified the laws, a task already begun by his predecessor; and while he has modernized procedure in a degree, there yet remain many quaint survivals of the days when the Vladikas made law by whim or wrote into the statutes the superstitions of the people. For example, by law in Montenegro the eating of a hedgehog is regarded as an offense against nature, and not long since a peasant was imprisoned for it.

Respect for age is enjoined by law, and in the articles regulating public conveyances it is provided that the traveler may have the seat indicated by his ticket, but it is added, "The deference due by youth to age requires that the former yield the better place to their seniors." Another article declares the equality of all before the law, and lays down the democratic principle of the universal ownership of land and equal right of all to hold office.

Another allows a man who is struck to kill the striker, provided it be done at once. If he delays, it is murder. In short, the Montenegrin code aims to be the embodiment of that "civil and religious liberty" which, it avows, is "the reward of valor."

THE PRINCE BECOMES A KING

Probably Nicholas himself would count the chief among his achievements the assumption of a kingly title upon the completion of 50 years of rule. The jubilee, the royal honor, and the king's golden wedding were coincidently and joyfully celebrated at Cetinje.

Those were splendid days for the Petrovitches, who gathered in force. Preeminent among them, of course, was the beautiful queen of Italy. With her were the two stately grand duchesses of Russia and the Princess of Battenberg, whose marriage had led the King to retort to one who had taunted him that Montenegro had no exports, "Sir, you forget my daughters." There, too, was the son of the King's dead daughter, the Crown Prince of Servia, and the three princes and two charming princesses who make up the royal group at home.

Thither came the Tsar of the Bulgars and the Crown Prince of Greece. The Sultan sent a special embassy, but other

Photo from Katrice Nicolson

SHALLOW WATERS OF SCUTARI LAKE

nations contented themselves with sending letters of felicitation by the hands of their ministers in residence, and among them the American alone was able to hail Nicholas as King, for Mr. Taft had taken care to address his great and good friend as His Majesty, and Nicholas has never forgotten that the American President was the first chief of state who addressed him as King.

There, too, were the deputations from all the clans of the Black Mountain, and as they passed before the palace and made their obeisance to the Gospodar one was struck with the instinctive and natural grace of these Highlanders, whose courtesy is the fruit of their centuries of freedom.

MOTOR CARS ARE SCARCE

Nicholas alone of Balkan monarchs lives among his people—an undertaking which is rendered easier by the limits of his kingdom. At every considerable town there is a royal villa, and among the delights of life at Cetinje is the privilege of automobiling with the King to spend the week end at Rieka, Krusovac, Niksic, or Antivari.

Practically the only motor cars in Montenegro are those in use by royalty, and as the machines purr along the splendid roads all the peasants working in the fields, even the most distant, straighten themselves and make a deep obeisance as the car passes, and at every halting place the people swarm up to see if they may have the privilege of kissing the royal hand.

It has been my good fortune to make frequent excursions of this kind, and once, as we went to Niksic, we were less than two hours from Cetinje when we entered upon the territory which Nicholas himself had taken from the Turks during the Russian war. Passing north from Podgoritza, we soon passed the old Turkish stronghold of Spuzh. Spuzh is a perfectly conical hill set in the middle of the meadows of the Moraca River. It had been a fortress in Venetian times, and their old battlements, as strengthened by the Turks, still crown its heights.

As we bowled along the King described the campaign which resulted in the capture of the fortress. On every hand were the reminiscent landmarks.

Photo from Katrice Nicolson

PASSENGERS ON SCUTARI LAKE

Over this hill he had dragged his cannon with men and ropes. Upon that height was Suleiman Pasha with 30,000 troops. At this spot was a Montenegrin brigade. From this the assault was ordered. "And what is there now, sir?" I asked. The King drew himself up and answered solemnly, "Seven million Montenegrin cartridges!" And it is worth noting that the only manufacturing establishment of consequence is the cartridge factory.

"AN ATTILA WITH MACHINE GUNS"

South of Spuzh lies Podgoritza, once Turkish, and still retaining the minarets and the unkempt Moslem cemetery to point to the order that has passed. It is the most considerable town of the kingdom, yet it has no more than 6,000 inhabitants.

The Albanian frontier lies but a short distance to the east, and during the Albanian revolution of 1911, as we sat in the square before the dismal hotel sipping our evening coffee beneath the mulberry trees, we could watch the twinkling campfires of Torgut's column moving upon the rebellious Malissori—"like an Attila with machine guns," as Miss Durham used to say.

Photo from Katrice Nicolson

SOME MOUNTAIN WOMEN IN MONTENEGRO

From Podgoritza north one passes Danilograd, where the King has established a flourishing agricultural experiment station which will probably be found of use to his people, now that their thirst for blood has been slaked, and an asylum for the insane, which is almost tenantless.

Next comes Niksic, another of the spoils of the last war, where the King has built a villa directly facing the old Turkish fortress which he had captured and from whose ramparts he proudly flies the royal standard when he is in residence. Next to the villa stands the church, a fine structure, designed by Nicholas and erected to the memory of the heroes of the war of '77. Here, too, is the principal prison of the realm, whose inmates are allowed great freedom, and the one symbol of progress of all the world—a brewery.

Between Danilograd and Niksic lies Ostrog, the famous mountain monastery and stronghold, whither withdrew, two centuries ago, St. Vasili, Metropolitan of the Herzegovina, and founded the shrine so often besieged and so valiantly defended—once by only 28 men, under Mirko, King Nicholas' father, who held at bay 10,000 Turks for eight days and then succeeded in making his escape at night.

THE PORT OF MONTENEGRO

Antivari, the chief seaport, is a thriving place. Taken by Nicholas himself during the Russo-Turkish war, he has built a new town directly on the shore, two miles or more from the old Turkish city, up among the Albanian foothills. Here is one of the numerous royal villas, and here the Italian concessionaires have poured out their lire in making a port and building a railroad which zigzags up the hills and darts through a tunnel near the summit before beginning its tortuous descent to the Lake of Scutari beyond.

There is little commerce and almost no manufactures in the Black Mountain.

Photo by Emma G. Cummings

GREEK PEASANT STANDING BEFORE HIS HOUSE, BETWEEN BRALO AND DELPHI

The tobacco is excellent, and an Italian company has its monopoly. A few coarse stuffs are woven at Podgoritza, but practically everything is imported. Duties are high and prices are extortionate.

Happily the people's wants are simple; but to bring even a scanty living from the reluctant soil requires unremitting industry. Everywhere, in sheltered nooks and upon the gentler slopes, the earth has been painstakingly gathered up behind retaining walls, and the gray hillsides are dotted with these little patches of green, most of them no larger than a tablecloth.

Near the Lake of Scutari the vine grows luxuriantly, and it is one of the King's hopes that some day, when permanent peace shall have fallen upon the Black Mountain, the fertile meadows may be drained and cultivated and that Montenegro may become the granary of that portion of the world.

RELIGION AND EDUCATION

The established religion of the land is, of course, Orthodox Greek. The clergy, headed by the Metropolitan of Cetinje, are a splendid lot of men in physique and character. The Catholics, numbering some 13,000, have their own archbishop

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LOOKING WEST FROM THE ACROPOLIS OF TROY, TOWARD BURNABASHI

The mountain on the sky-line marks the Island of Tenedas, which is just opposite the harbor of Troas. Where once the ancient City of Troy reared its majestic walls, sheep now find pasture, while the shepherds in their peculiar dress while away the dreary hours by playing on their flute of reeds.

at Antivari, and the few Mohammedans possess a Grand Mufti.

Perhaps the most striking testimony to Nicholas' tact as a ruler is to be found in these three religious groups dwelling amicably together and all possessing and professing a like affection and honor for their Sovereign.

Education is not advanced. The schools are few in number and most elementary in character. At Cetinje there is the Institute for Girls, founded by the Empress Marie Feodorovna of Russia and maintained by Russian bounty. Here several score of girls are trained in domestic arts, music, and the studies which with us are preparatory to high-school work. This school has had a large influence upon Montenegrin life, and, thanks to it, the position of woman is becoming each year more tolerable.

Another Russian establishment is that for the training of cadets, and indeed it would be difficult to find any Montenegrin activity where Russian influence is not exerted. A Russian subsidy maintains the army, and two years ago from Russia came arms, uniforms, tents, cannons, saddlery, and the complete equipment for 50,000 men. A Russian military commission has been busy at Cetinje for years, and the Russian military regent has long been a most conspicuous figure in Montenegrin life.

WHERE RUSSIAN INFLUENCE FAILED

Yet Russian influence was unable to restrain the Montenegrin initiative in the present war, and King Nicholas never showed to better advantage than when he informed the spokesmen of the Great Powers that they had come too late. Within an hour from that declaration he had sent the Turkish Minister his passports, and the next morning we heard the first gun in the war whose results have so astounded the world.

If I have seemed to give too large a share of my allotted theme to the consideration of Nicholas and his Black Mountaineers, my excuse is that the other portion of it is measurably familiar.

To separate the life of modern Greece from the splendors of its classic or Byzantine days is not easy, and the Greeks themselves would be the first to resent it. They, of a truth, deem themselves the direct descendants of the worthies of classic days, and certain it is that their life has shown a persistent continuity which warrants the claim.

Whether their land has been ruled by a Roman emperor, a Frankish duke, a Venetian baillie, or a Turkish pasha, the thread of Hellenic existence has remained unbroken. In the monasteries have been preserved their religion, their tongue, their traditions; mothers have taught their children the glories of the Greek heritage, and today the Greek people stand forth in character, at least, exactly as they did in days of yore, as Aristophanes pictured them, as St. Paul described them, and as every classical scholar has learned to regard them.

THE PARIS OF THE LEVANT

In many ways Greek life remains unchanged from its classic aspects. Modern Athens, to be sure, is a brilliant capital well worth its title, "The Paris of the Levant." Less than a century ago it passed finally from Turkish possession, and it was then a small collection of mere hovels huddled beneath the Acropolis.

Today it is a city of wide and gay streets, dotted with small parks and adorned with many handsome public buildings, most of them the gifts of rich Greeks who have delighted to spend in the mother country the fortunes which they have earned abroad.

To such generosity Athens owes the noble group of buildings which comprise the university, the National Library, and the fine classic reproduction which houses the Academy of Science, and above all and to my mind the most interesting, the noble stadium, built upon the old foundations and along the old lines and ingeniously carrying in its fabric every fragment of the old structure which could be found.

In the midst of all this modernity stand the remnants of the golden days of Athens sedulously preserved, and open to inspection and study with a freedom nowhere equalled. The focus, of course, is

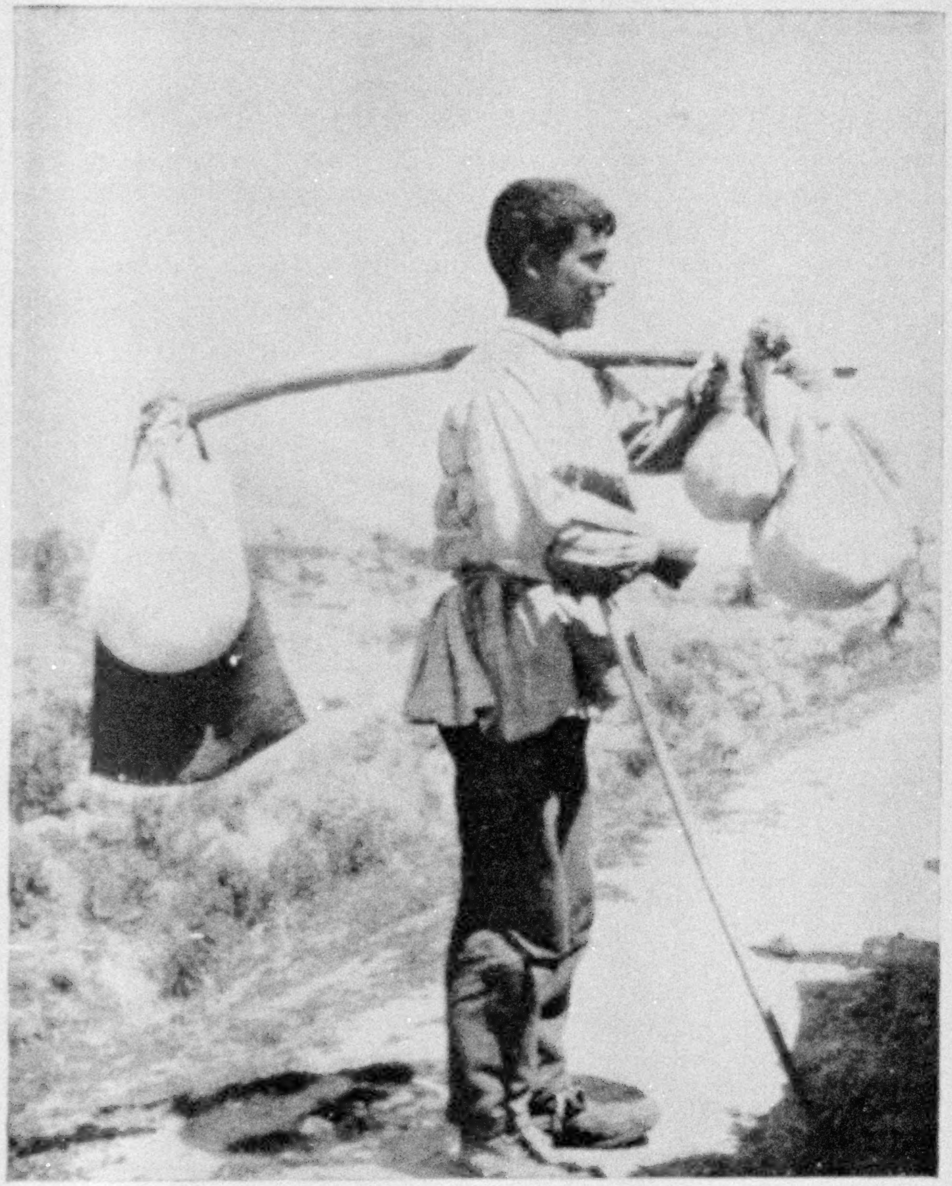


Photo by Emma G. Cummings

GREEK PEASANT CARRYING MILK

Photo by Emma G. Cummings

GREEK SHEPHERD AND SHEPHERDESS IN THE PELOPONNESUS

Photo by Emma G. Cummings

PEASANTS AND FLOCK, NEAR EPIDAURAS, GREECE

the Acropolis—incomparable even in its ruins—its cliffs and grottoes still the home of legend and of fable.

All the cycles of Athenian life are represented. The classic temple of Theseus, best preserved of all the ancient monuments, recalls the days of Pericles. The Stoa of Hadrian speaks of that distant day when a Roman conqueror ruled the violet crowned city.

While the early Christian era finds its survival in the beautiful Byzantine churches, the most striking of which is that of St. Theodore set down in the midst of one of the great business streets of the city and scrupulously guarded from encroachment. Of Turkish days there remain few traces, though the bazars, as typified by the Lane of the Little Red Shoes or Hephaestos street, the home of the coppersmiths, are more oriental than Hellenic or European.

In this land of changing allegiance the marks of Venetian rule were set deep and strong. Corfu today, in its externals at least, is more Italian than Greek, while Nauplia, Patras, and many of the island seaports still find useful the battlemented fortresses erected by the Latin rulers.

"A GRAVE NATIONAL HEMORRHAGE"

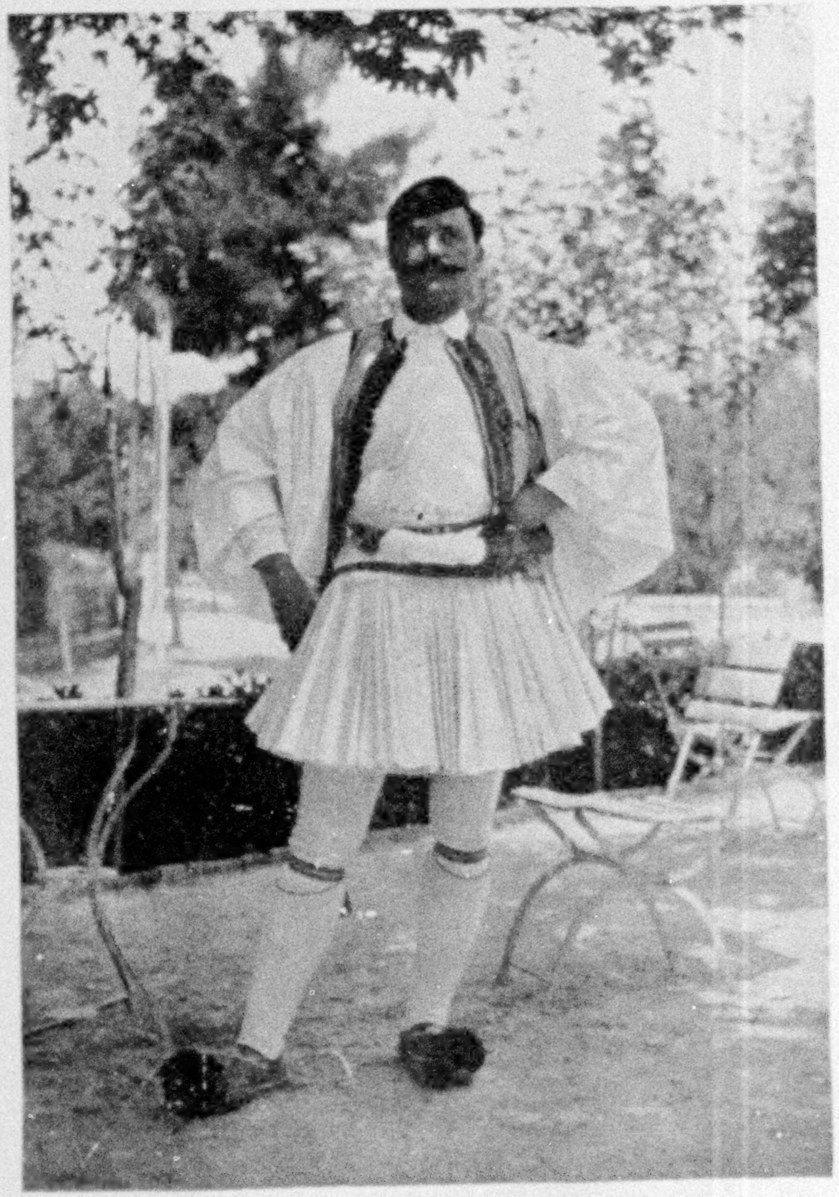
As of old, the Greeks swarm the seas. The Piræus is one of the busiest of Mediterranean ports—indeed, it is the center of transhipment for all the East—while the Corinthian Canal, after many financial vicissitudes, now seems to be in the way of becoming each year a more and more useful route between the Ionian and the Ægean Seas.

The Greeks are a town people. One-tenth of the population is to be found in Athens and the Piræus. The drain of emigration from the rural districts is enormous. In the words of a Cabinet Minister, it constitutes "a grave national

Photo by Emma G. Cummings

GREEK PEASANT AT MYCENÆ

"At Megara the native costume appears at its best. It is rarely seen anywhere nowadays, and has almost wholly disappeared from the cities. But for the Evzones, or household troops, the fustanella would be as rare a sight in Athens as the classic garb, which is worn only by Americans" (see text, page 303).



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GREEK IN SUNDAY COSTUME

Showing the fustanella, the kilt of white cotton or linen, which is worn very full and starched. It is worn by the Greek peasants on holidays and by the royal bodyguard of the King of Greece. It is, however, of Albanian rather than of Greek origin, and is found in the Albanian colonies in southern Italy.

hemorrhage." Indeed, in some villages in the Peloponnesus there remain scarcely enough men to fill the offices.

In one sense, however, the emigration has been of benefit to the country, for large sums of money are sent back each year, especially from America, to the families who remain behind, and to this may be traced the gradual appreciation in the Greek paper currency, which, as against a depreciation of some 40 per cent, is now, and has been for several years, at par or better.

I remember that my bankers, in 1911, were able to buy Napoleons at 99 and a fraction in Greek money, and it was at this time that the wife of one of my colleagues complained that, owing to the high price of the drachma, she felt unable to keep an automobile.

Country life in Greece remains in many of its aspects as it has been for ages. Within two hours' drive of Athens I have seen peasants plowing with a crooked stick exactly as they did, I imagine, in the days of Homer. The shepherd boys of today manage their flocks with a crook that bears the lines of that carried by Corydon. And in Thessaly one sees the solid-wheeled cart which has come down without substantial change from the days of Jason. The distaff remains as the chief instrument in preparing the wool for the hand-looms, and is rarely absent from the busy fingers of the older dames; and the women gather at the fountains for their washing as did Nausicaa and her maids did on that day when Odysseus came to port.

THE GREEK LIVES IN THE OPEN

In a land of much sunshine, as Greece is, life is followed much in the open. The oven is almost invariably to be found in the courtyard, and it is heated with dried twigs, almost the only fuel of the country, which are brought in huge piles upon the backs of the patient little donkeys, who vie with the goats in being the most useful members of the household.

Market day, of course, brings all the community together, and is generally an occasion of much gaiety, while the feast-days, which are numerous, are literally observed. On these occasions there is always dancing, the most famous to be seen at Megara during the feast of Easter week. Megara prides itself upon being a pure Hellenic community in the midst of the Albanian strain, which predominates in Attica, and its Easter dancing was once a famous marriage mart. It no longer serves this purpose, because, as the maidens sigh, so many men have gone off to America.

At Megara the native costume appears at its best. It is rarely seen anywhere nowadays, and has almost wholly disappeared from the cities. But for the Evzones, or household troops, the fustanella would be as rare a sight in Athens as the classic garb, which is worn only by Americans.

The church plays a large part in Greek affairs, and rightly; for it was the church which kept the national spirit alive during the long night of Turkish rule. It was from the famous monastery at Kalavrita, that the Archbishop Germanus unfurled the flag of rebellion in the war for independence, and this famous shrine has been more lightly dealt with than the most of the monastic establishments, which have now come under strict governmental supervision. Another favored monastic group is that at Meteora, in Thessaly, where the quaint buildings, perched upon their needles of rock, afford a fascinating risk to the venturesome visitor.

THE ORACLE AT DELPHI SPEAKS AGAIN

It is not yet easy to go about in Greece. The railroad lines are meager, the roads are not good, and the hotels leave much to be desired. The most accessible of all the great centers of classic life is Delphi, a fitting shrine for an oracle, with its massive cliffs and majestic hills. Here the French have brought to light the ancient city with its treasures, its wonderful Castalian spring, its theater, and its sacred way.

That it still retains its oracular powers I can testify; for when I was last there, about a year ago, my Dutch colleague stood upon the spot where Baedeker told us the tripod and the priestess had sat. "Who will be the next President of the United States"? I asked, and the oracle said solemnly: "The best man will win."

XUM

Photo by Emma G. Cummings

PEASANT WITH DISTAFF, SPINNING AS SHE WALKS

The Greek royal family are claimed as the best looking, the most charming-mannered, and the best behaved royalties in Europe. I believe it to be true. Court life is democratic and simple, the late King much preferred his life as a farmer at the Château of Tatoi to that of the palace at Athens. Queen Olga and the princesses devote themselves to good works, and the princes have so recently given such good account of themselves on the field of battle that words of mine are needless.

My chief criticism of modern Greek life would be that the young men of good family and of fortune have not turned themselves to the economic development of their country. Manufacturing and agriculture have been almost wholly neglected, and all that one wears and much of what one eats is brought from abroad. The owners of estates have considered them chiefly useful as a foothold for a seat in Parliament—that one-chambered and often turbulent body where have centered the chief defects in Greek development.

POLITICS THE CURSE OF THE GREEKS

To speak the truth, the curse of politics has overlain all Greek activities since the establishment of the kingdom. And politics in Greece has meant a sordid thing. There are no questions of principle which divide parties there. Economic conditions demand high tariffs; on foreign questions there is no division; sociological problems have not developed along party lines—and so it has happened that parties have now grown up with well-defined lines of cleavage in policy, but have arisen from time to time in accordance with the ambitions or political necessities of individual leaders—and the struggle has been wholly between the ins and the outs.

Thus it has happened that maladministration has been the rule. I have never inclined to the belief that Greek administration has been dishonest. In fact, the modest budget forbids graft on any scale to be really dangerous, but wastefulness and poor service have been common to all ministries.

I speak of this in the past tense, be-

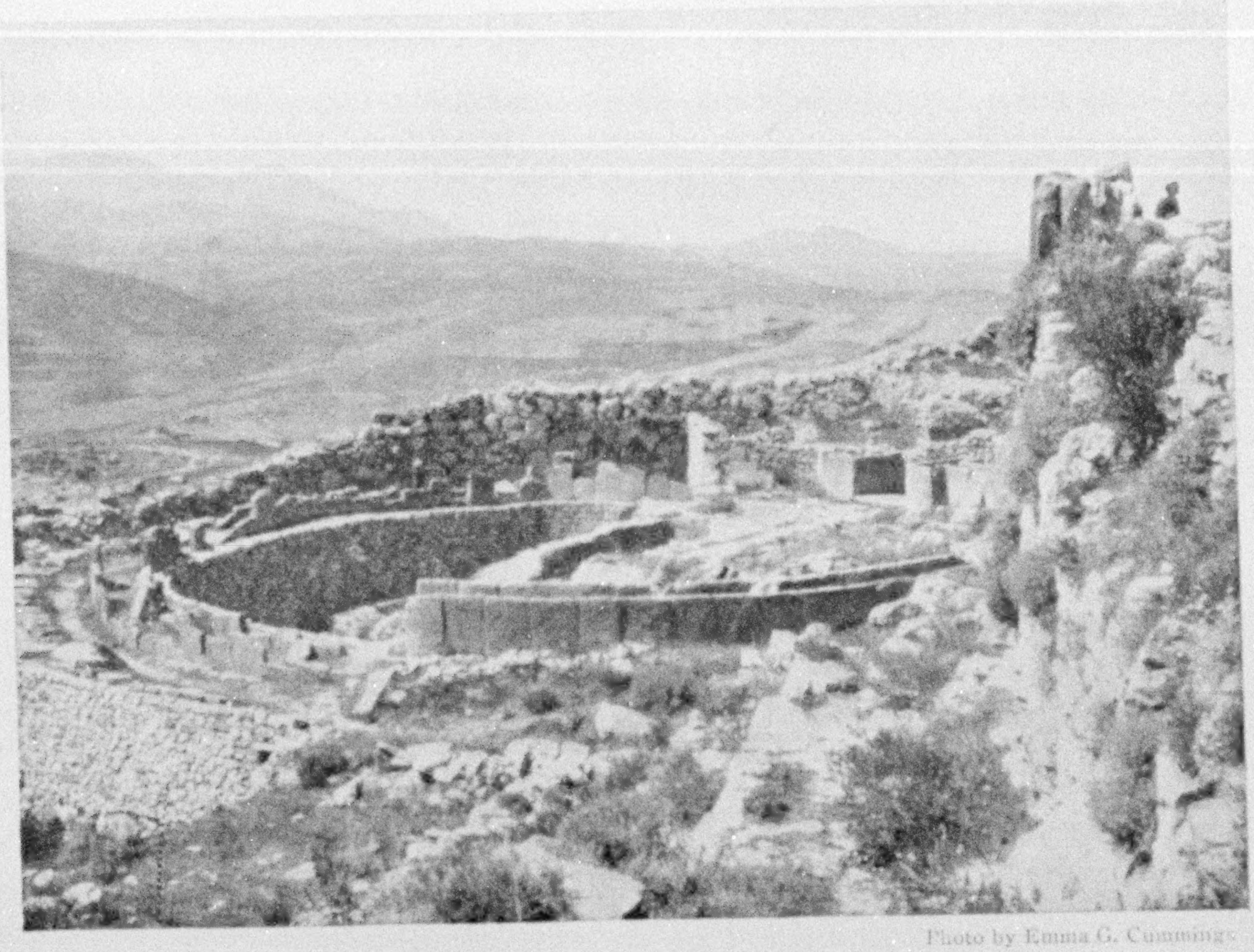


Photo by Emma G. Cummings

SITE OF THE ROYAL TOMBS, DISCOVERED BY SCHLIEMANN IN 1876, WHICH CONTAINED AN EXTRAORDINARY QUANTITY OF GOLD AND OTHER ORNAMENTS

The circular space in which these were found was inclosed by a double circle of upright stone slabs, covered with horizontal slabs

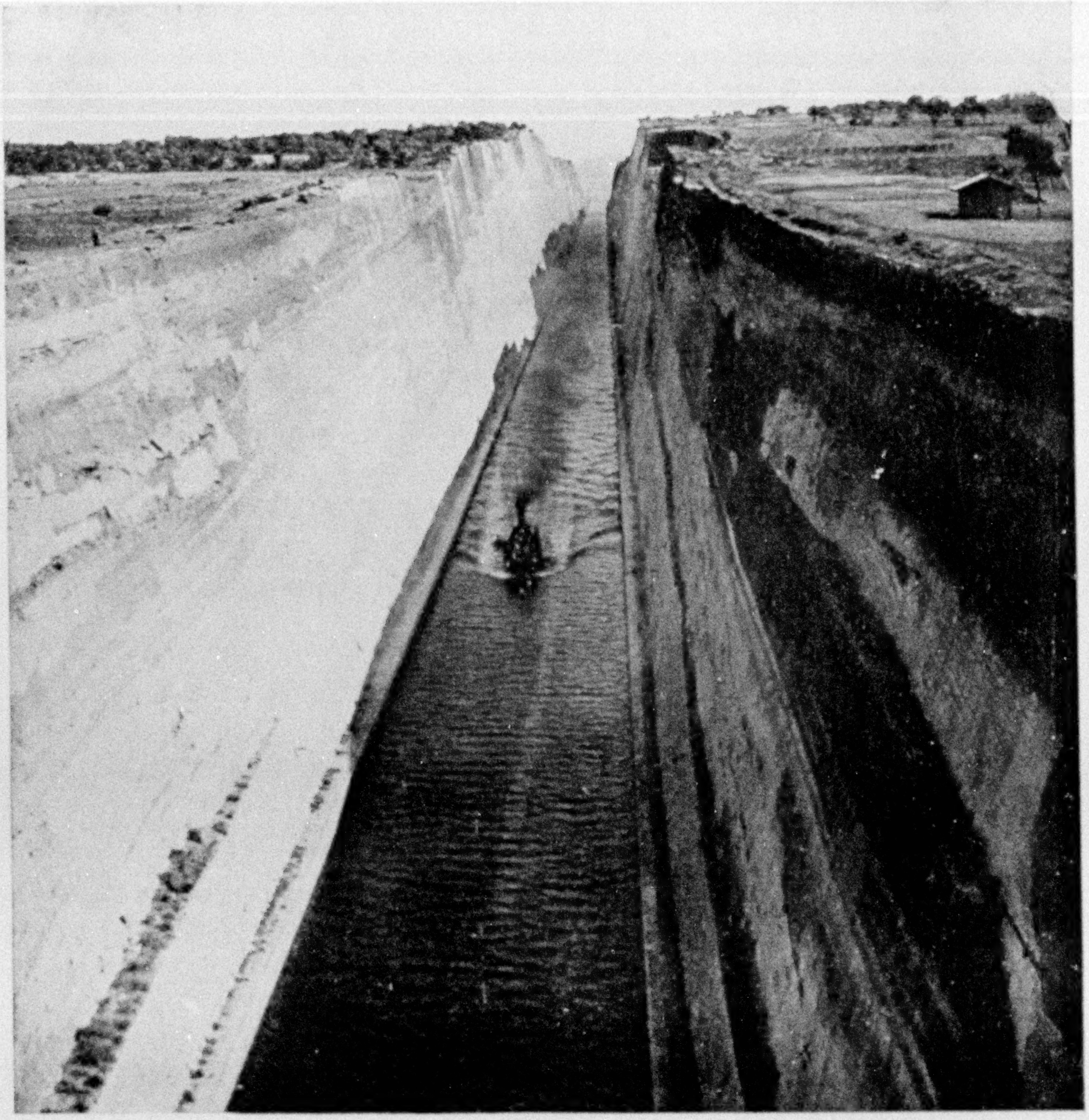
cause I believe that a new day has dawned for Greek public life. The bloodless revolution of 1909, which had its origin in the determination of a group of officers to purge the army and the navy of their political ills, has gone much farther than its authors had foreseen, and as a result Greek hopes now center in one man, who, brought to Athens from turbulent Crete to rescue the Military League from the depths of the parliamentary muddle into which they had fallen, became in 10 months the prime minister of Greece, and in three weeks thereafter had demonstrated himself the master of a situation which had baffled all of his predecessors.

A GREEK BISMARCK

This man, Eleutherios Venizelos, is a Greek of the Greeks, with a long line of distinguished Hellenic ancestry. Educated at the University of Athens and in Switzerland, he was established himself as an attorney in Crete, and was active in the revolution movements which brought on the Greco-Turkish war of 1897.

Upon the establishment of the High Commissioner's regime in Crete, Venizelos and Prince George were not in accord, and the prince's withdrawal from the island followed—an incident which led the court party in Athens to regard Venizelos as an arch-revolutionary and to render his task the more difficult.

The Greek people, however, have never wavered in their support of him. He is their idol—and he justifies their idolatry. Summoned to the prime ministry much earlier than he had believed himself ready for such power, and knowing full well that he owed his preferment in a large measure to the wishes



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SHIP CANAL, LOOKING EAST: ISTHMUS OF CORINTH, GREECE

The idea of a canal through the Isthmus of Corinth dates from Roman times, when the Emperor Nero started excavations in the year A. D. 67, but the project was soon abandoned, and not until 1893 was the canal actually opened. It is nearly 4 miles long, some 70 feet broad, and 26 feet deep, but the strength of the current running through it, together with its narrowness, impedes its full usefulness.

of the old political leaders, who had conceived the notion of choking him to death with power, he has confounded his enemies, amazed his friends, and justified all the fond hopes of the people, who regard him as the embodiment of their future and who have never ceased to hail him as the savior of Hellenism.

Twice his ministry has been forced to appeal to the electorate—once by his own wish to test Greek public opinion and once because the constitutional limit had run against his government. In each case he has been swept back into office with a majority of cumbersome proportions—and he has rightly counted himself as a man with a mandate to reorganize Greece.

Photo and copyright by H. C. White Co.

MEDIEVAL FORTIFICATIONS OF THE ACRO-CORINTH: CORINTH, GREECE

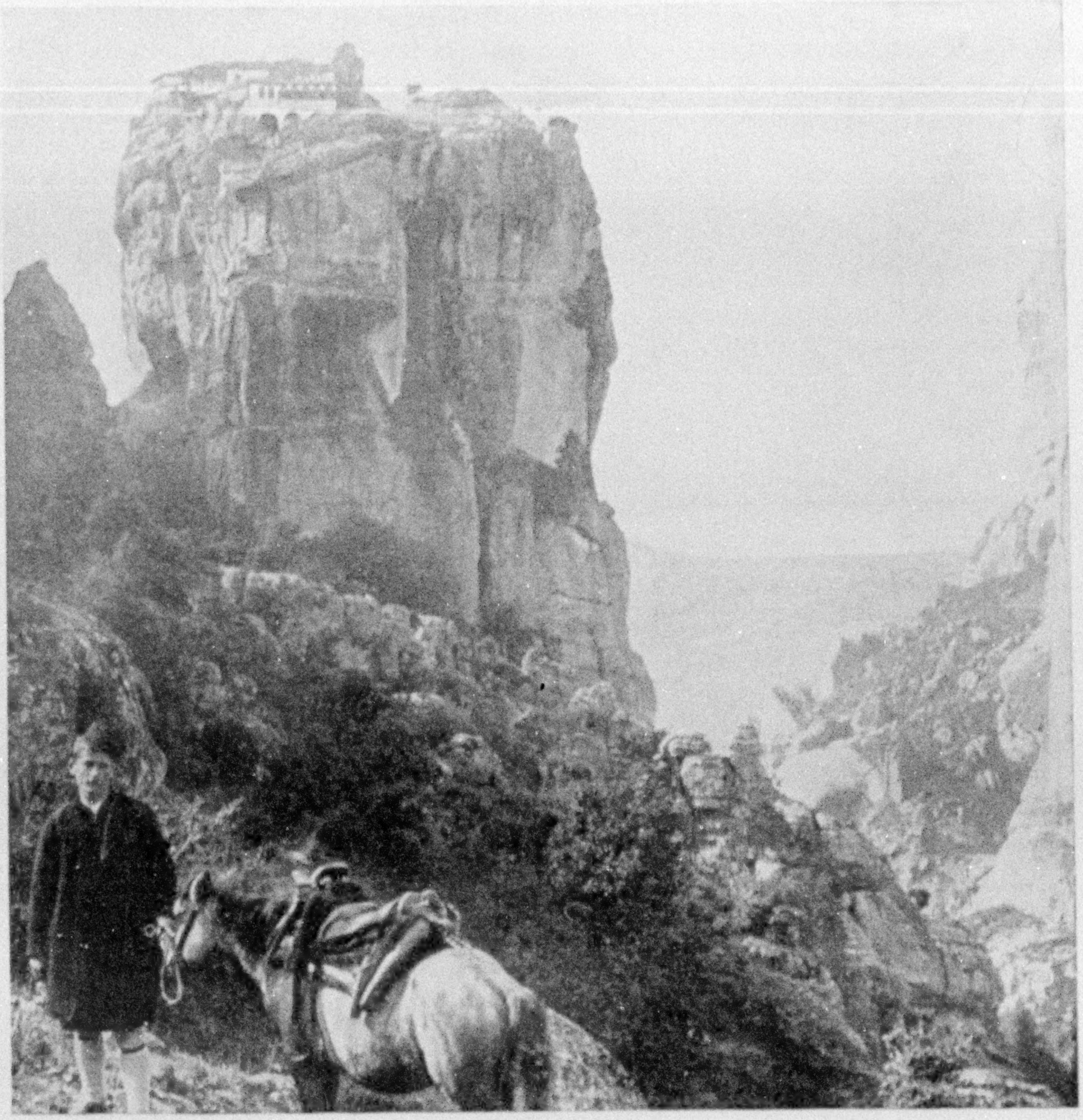
Under his guidance the constitution has been revised, the chamber has been liberated and set in the way of constructive legislation, while the electorate has been given a wider privilege of choice of their representatives. The courts have been given tenure and removed from political control.

The ministries have been reorganized and purged and the civil service has been set upon a merit basis. Agriculture and commerce have been taken under the charge of a new ministry. Municipalities have been granted new rights and charged with new duties; and a general quickening and efficiency have been infused into all branches of the administration.

THE ORIGIN OF THE BALKAN LEAGUE

Emphasis, however, has been laid upon the work of reorganizing the army and the navy, and French and English commissions have respectively undertaken that task. How well they have succeeded was foreshadowed at the joint maneuvers of last spring and demonstrated beyond question in the engagements of the war which is now drawing to its close.

To Venizelos, more than to any other,



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MONASTERY OF HAGIA TRIAS (HOLY TRINITY), ON THE MARVELOUS METEORA ROCKS, NORTHERN GREECE

is due the Balkan Federation. His was the initiative that opened the negotiations, and it was his controlling political genius that shaped the *entente* in most of its details. The powers of Europe and its diplomats were staggered by the news of his success. Though well warned by frequent rumor during the year and a half that the negotiations were in progress, they refused to think it possible that two races who had dealt with each other as ferociously as the Greeks and the Bulgars in Macedonia could be brought into accord, no matter how great the stake.

Yet nothing was more obvious than this, and from the moment that Venizelos came to power in Greece and called to his side that talented statesman, so well known, from his service in the United States as Minister of Greece, it was evident that the long-cherished ideal of Balkan statesmen for an effective agreement toward an amelioration of the lot

of the subject Christian peoples in European Turkey was in the way of realization.

A Balkan federation has long been dreamed of, and the first steps toward its attainment were taken some 30 years ago by the then Prime Minister of Greece, Charilao Tricoupis, of whom it is said by the ardent Venizelists that he was an earlier Venizelos, while the Tricoupists refer to Venizelos as another Tricoupis. That attempt failed, and for nearly a generation the Balkan *entente* was relegated to the realm of academic discussion.

In the meantime the Turkish policy "Divide and rule" had set the Greeks and Bulgarians at each other's throats, and there had ensued an era of blood in Macedonia, wherein the province was ravaged by marauding bands of Greeks, Bulgars, and Serbs, who waged a war of extermination against each other.

This barbarous policy had carried itself nearly to exhaustion when Venizelos came to power at Athens, and to him it was suggested that an attempt at a definite agreement be made among all the nations having racial pretensions in Macedonia and Albania.

A beginning was made at once, the first exchanges being purely unofficial. It was soon found, however, that formal undertaking were possible, but it was nearly a year before any effort was made to reduce to terms the basis of agreement.

THE MONROE DOCTRINE OF THE BALKANS

It was thought best to simplify the first declarations, and the same counsellor who had first engaged Venizelos' attention to the subject advised that the Allied States should unite in a promulgation of a Monroe doctrine for the Balkan States. For this policy the lamented Milovanovitch, then Prime Minister of Servia, became the spokesman, and one of his last—as it was surely the most important—of his public utterances was a speech in the Skuptchina at Belgrade declaring the doctrine of the Balkans for the Balkan peoples.

Nearly coincident with this came the transfer of Mr. Coromilas from the ministry of finance at Athens to that for foreign affairs, and the negotiations took an immediate impetus from his active persistence. The early summer saw their completion, and for the first time the Balkan States were in position to present a united front to their traditional enemy.

The Balkan Federation was not, however, predicated upon immediate war. Greece, at any rate, felt herself unready. The work of national reorganization under Venizelos' lead was far from complete. The finances, to be sure, were in excellent condition. Indeed, Greece alone among the allies had any considerable sum of money on hand when hostilities began. But much remained to be done with the army, and the navy was awaiting the new battleship for which the contract had only just been awarded. And, on the whole, the allies preferred a peaceful solution of the difficulty if it could be had.

Their fundamental desire was to secure tranquillity and good government in Macedonia and Albania, believing that with this the evolution of time would bring to them their natural zones of influence, even as eastern Rumelia had been added to Bulgarian territory. They calculated not a little upon the fetich of the *status quo*, which had always been before the eyes of the Great Powers, and they reckoned that an effective intervention would prevent their coming to grips now.

A NEW ERA FOR THE NEAR EAST

Their plan in brief was to mobilize and to present an identical note to the Porte demanding immediate reforms in Macedonia and Albania, at the same time notifying the powers of their action and of the terms of the note. Their expectation was that the powers, fearful of the long-dreaded explosion in the Balkans, would then step in and enforce the major portion of the demanded reforms.

It must be admitted that the allies had no considerable confidence in the results of these reforms as administered by Turkish authority, and that they felt that conditions would again be beyond en-

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durance after a few years; but by that time they knew that they would be ready for war, and were content.

The general lines of this program were carried out. The powers, as so often before, failed to meet the expectations of the allies and drafted an ultimatum to the Balkan governments, the terms of which were almost immediately made ridiculous by the fortunes of war. The rest is now history; and when the treaty of London is finally cast into enduring terms, it will be found that the Balkan allies have remade the map of Europe as none have done for a century.

Will it prove that they have also put an end to the specter which has so long lurked behind every aspect of the Near Eastern question? That they have found tranquillity for lands long harassed? That they have, to use the words of Lloyd-George, extended the boundaries of liberty and good government? That they have brought deliverance to the oppressed?

That they have, in short, opened a new era in the Near East, in the course of which those long in terror and subjugation may enjoy life, liberty, and the pursuit of happiness, and in which a plenteous prosperity shall reign in a region where desolation and poverty have so long held sway?

They so believe, and I with them.

MEGASPELÆON, THE OLDEST MONASTERY IN GREECE

By Carroll Storrs Alden

With Photographs taken by the Author

I REMEMBER the consternation with which, when a small boy, I heard my uncle observe that Americans were overrunning Europe, and that in a few years there would be not even a village they had not visited and made common. The doom of Europe was thus pronounced. With dismay I realized that when I became a man and traveled like my uncle, Germany, Russia, and all other lands would be completely tamed; I would see them but as Chicago (my home city) repeated again and again.

However, Europe is like one of those old home-spun garments which, though slightly faded, is extremely durable; and, as patching is not an easy process, most of Europe still remains Europe. Americans are far from being everywhere, and on going to Greece in a recent summer I wandered for several weeks through city and village, and outside of Athens met just three of my countrymen—one man and two college women.

Under such conditions the sociable man is likely to feel intensely lonely, and it is curious how he will sometimes encourage himself, as he might a child, by appealing to his pride; thus, if I did not emphatically approve, at least I made no remonstrance as the solitary young Texan I met at Tiryns denounced our countrymen as poor creatures of convention, traveling only where thousands had preceded them, and shrinking timidly when they encountered the least hardship. "They're even afraid of dirt," he contemptuously concluded. It was plain that he was not, and I presume that I also bore the dark badge of courage.

THE MONKS IN THE CAVES

One of the places in Greece fairly easy of access, yet rarely visited by Americans, is the monastery of Megaspelæon. As the name signifies, it is the monastery of the *Great Cave*, and the cave-dwellers, though not belonging to prehistoric times, are like a relic of the middle ages.

It is the oldest of Greek monasteries, tradition affirming that it was founded in the fourth century; probably the real date is about 1,000 years later; it is also the richest, for it has extensive holdings

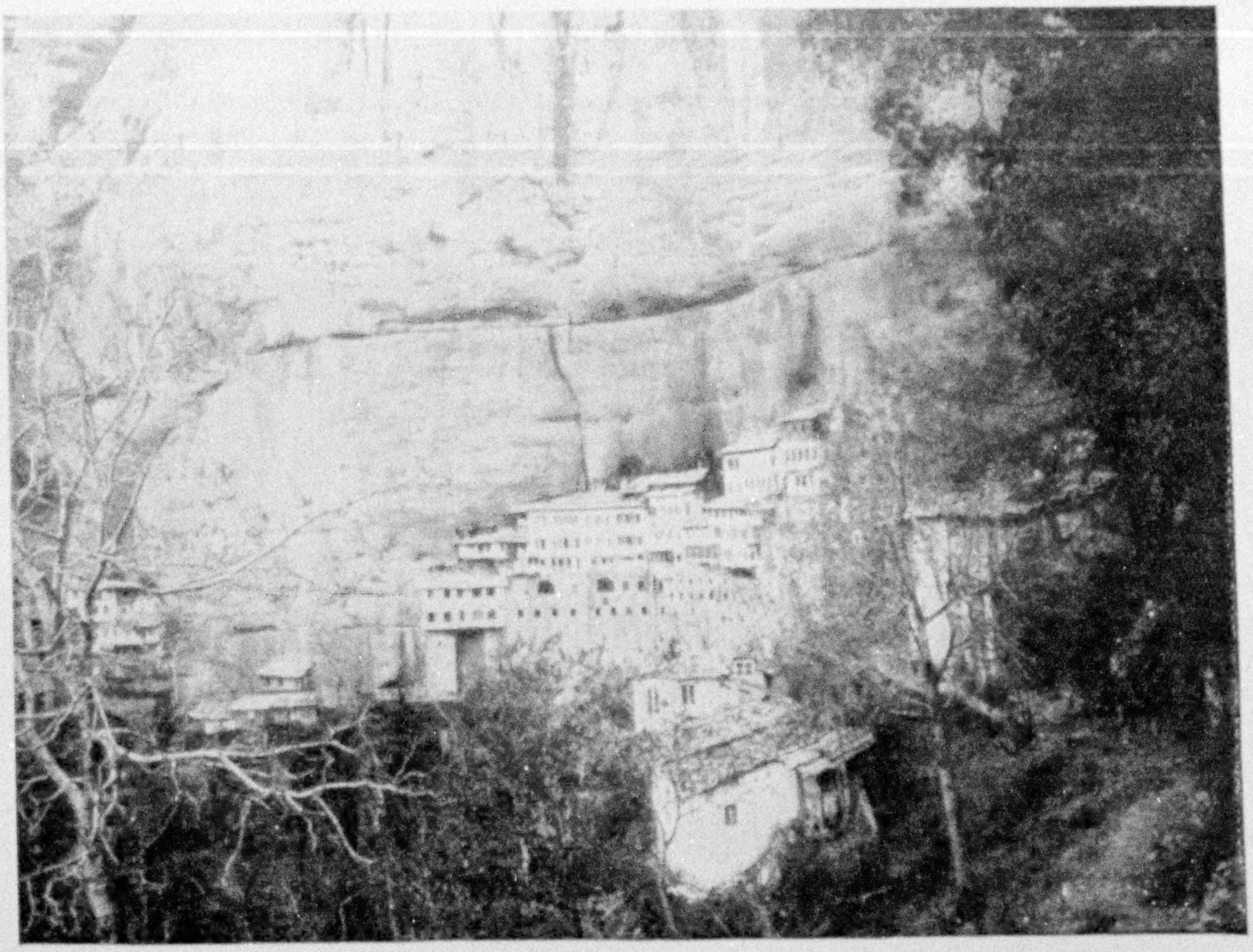

Photo by Emma G. Cummings

ROCK MONASTERY OF MEGASPELÆON, THE MOST IMPORTANT IN GREECE, ON THE SIDE OF A GREAT CLIFF

The buildings date from 1640. The monks derive their income from extensive lands in the neighborhood and also from houses in Smyrna and Constantinople

in Elis and other States, and with the growing prosperity of Greece these lands are rapidly increasing in value, making Megaspelæon one of the richest monasteries in all Europe. About 140 monks at present live here, not including those whose duties, such as collecting the rents, keep them much of the time away. They have a government like that of a republic and they elect their own abbot.

Half way between Corinth and Patras I had left the main railway and took a cog-road that winds its way up a rocky gorge to Kalavryta, on the northern edge of Arcadia.

"Eis ton Megaspelæon?" [For Megaspelæon?] I inquired, as I looked into the already crowded combination car. (During my stay in Athens I had an English-Greek lady dictate 20 or 30 convenient phrases, which I had conned until I could utter them with some glibness.)

"Nai, nai" [Yes, yes], was the answer, and a youth of 20 crowded some rustics over so as to give me the best that could be had in the second-class compartment.

I tried to enter upon a conversation, but between my limited vocabulary and the strong reserve of the youth the attempt failed. However, as the train began to wriggle up one of the most picturesque valleys of the Peloponnesus, the youth showed he had not forgotten me by catching my arm and pointing to the unusually fine view as the mountain torrent burst through the sharply cleft rock.

WHAT IS THE RAILROAD ETIQUETTE?

Two enthusiastic young Greeks in the next seat also gave me some attention. They were from Athens, on a holiday

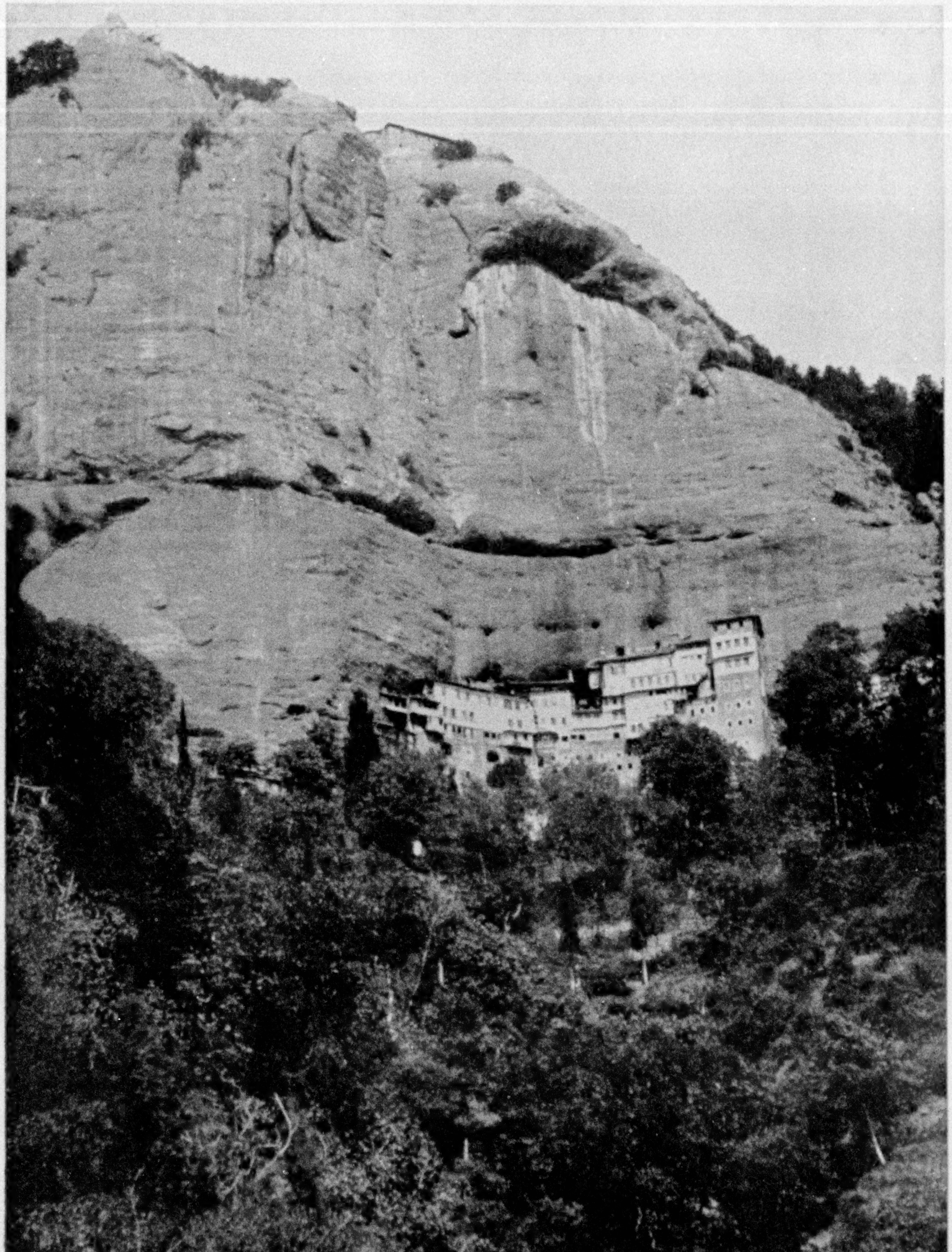

Photo by Carroll S. Alden

THE MONASTERY OF MEGASPELÆON SEEN FROM A DISTANCE, SHOWING THE VERDANT GARDENS AT ITS FOOT

"On retracing the path leading to the valley, I turned and caught my last glimpse of the monastery, in the distance no longer dirty and dilapidated, but thoroughly picturesque as it hung half way up the cliff like a huge swallow's nest" (see page 323).

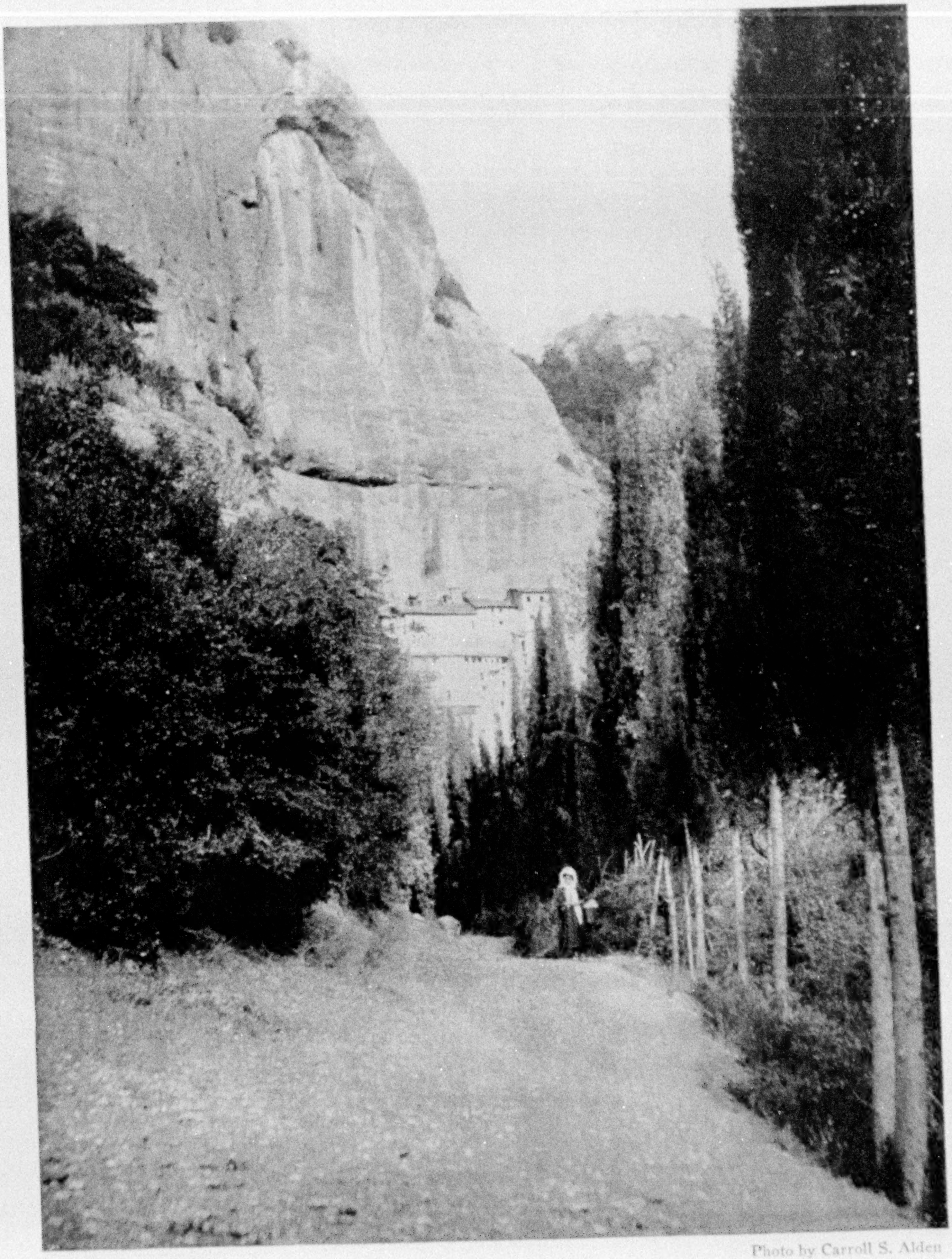

Photo by Carroll S. Alden

PATH LEADING TO THE MONASTERY OF MEGASPELÆON

"The monastery is 3,000 feet above sea-level, on the face of a large cliff. It rises out of a leafy bower and seems to be plastered against the bare gray rock of the mountain" (see page 315).

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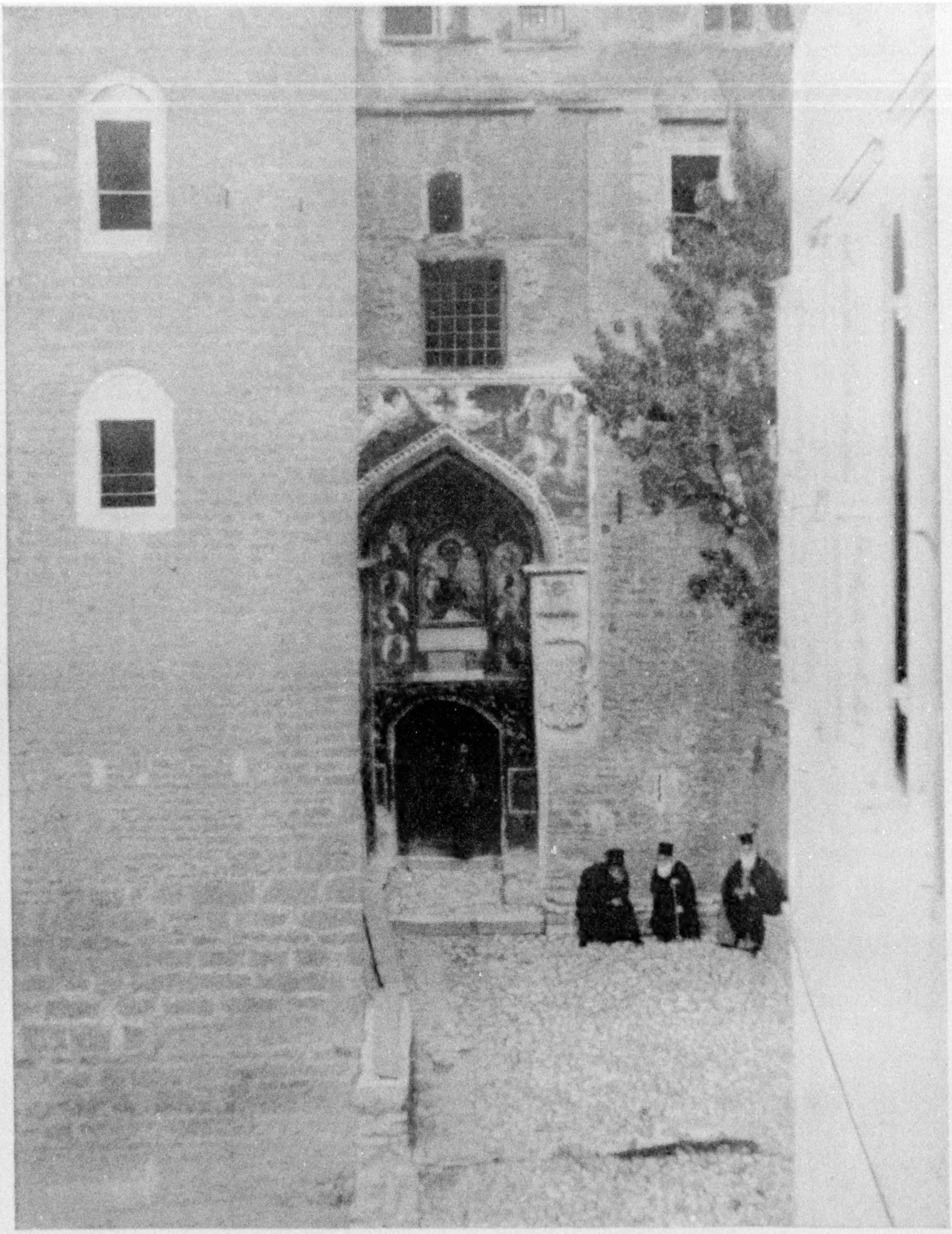

Photo by Carroll S. Alden

MONKS KILLING TIME AT THE ENTRANCE TO THE MONASTERY

"I could not help thinking what a miserable life is that of the monks of Megaspelæon. They send out no missionaries or preachers to the neglected people; they go through their services with considerable indifference; they have no interest in study; they write no books, nor do they, like certain orders in the Roman Church, care for the sick and the poor" (see text, page 323).

trip, and spoke a little French. Although my French is as uncertain as that of a girl at a boarding-school, we exchanged some ideas.

Later, as they opened a lunch-box, they offered me at intervals, first a sandwich, next an egg, later wine, grapes, and a pear. I began by declining, but the reserved youth at my side again manifested his interest in me. He had not been included in the luncheon party, but he plainly disapproved of my course of refusal. At each offer he would assure me, "Yes, good," and when I still refused, he became so earnest and insistent that I suspected that he was attempting to save me from a seeming discourtesy.

On leaving the train, I secured a donkey at a khan near by. The little beast proved of value, for the monastery is 3,000 feet above sea-level, in the face of a large cliff.

Soon I caught my first glimpse of the monks' home, apparently rising out of a leafy bower and plastered against the bare gray rock of the mountain. The winding path the donkey followed was not a little romantic, at times completely shut in by trees and shrubs, and later emerging and affording an extensive panorama. The tiny brook that crossed the path again and again, or the several brooks, I know not which, made pleasant music in a country where the soil is rocky and the rainfall slight.

HOW IBRAHIM PASHA OVERREACHED HIMSELF

The path as it approached the monastery became steeper and appealed strongly to the imagination; for this was the spot where the great Turkish commander, Ibrahim Pasha, had been kept so long at bay. During the war of independence, nearly a century ago, it was the monks from this vicinity who had first urged the people to throw off the hated yoke.

Naturally when Ibrahim Pasha had reconquered much of the Peloponnesus he thought in passing he would take the monastery of Megaspelæon and possess himself of its treasures; but the warlike monks, re-enforced by a few Pallikars, placed two cannon on the cliff above and effectually barred the progress of the Turkish army up the steep and narrow path.

However, Ibrahim, being a man of iron, was not to be thwarted. After spending some weeks in vainly trying to reach the monastery by the path, he sent a force which with great labor succeeded in gaining the heights above. One can fancy what then must have been the terror of the women and children who had taken refuge with the monks and the exultation of Ibrahim.

But a surprise came when his men began to roll down rocks from their vantage point and discovered that the monastery clings so closely to the overhanging cliff that the huge missiles fell wide of their mark. Doubtless as the boulders went crashing down the mountain-side they drove more than one startled and angry Turk to shelter.

A HOSPITABLE WELCOME

As I approached by the path, I came up directly underneath the monastery, whose huge wall rose 50 or 60 feet, with six stories of wood superimposed on this. A large bell rang to announce my arrival, and many a curious head peered down on me.

I slid off my donkey on reaching a platform before the monastery, and a lean, hungry-looking youth, bristling with a four days' beard, took my bag and led me up the stone steps into a building adjoining the monastery. The *Xenodochos*, a monk whose duty it is to provide entertainment for pilgrims and visitors, greeted me and soon had brought good cheer in coffee, Turkish style—muddy with pulverized grounds and very sweet. Most travelers are fond of it.

"*Anglos?*" he asked.

"*Ochi* [No], *Amerikanos.*" It was not a long conversation, but both of us were pleased at having exchanged an idea and by common consent lapsed into silence.

The large room into which I had been shown on arrival had eight coverless couches, which I supposed I was to share for the night with six Greek pilgrims, who had come to this their holy place. My supper was served in this room, but not with that of the pilgrims. I feasted in the august company of my own soli-

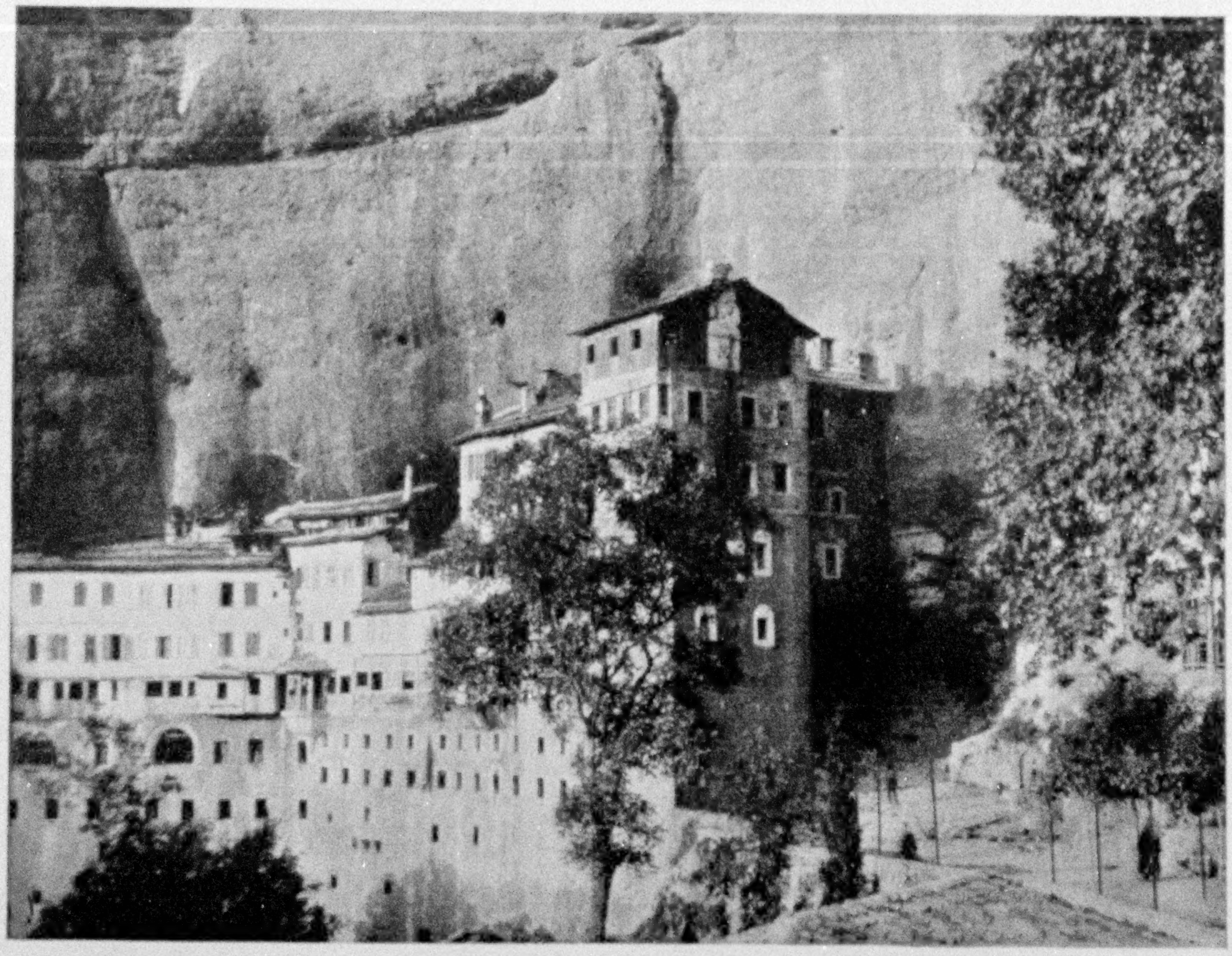

Photo by Carroll S. Alden

NEAR VIEW OF THE MONASTERY, SHOWING THE HUGE FOUNDATION WALL AND THE WOODEN STRUCTURES BUILT ABOVE IT

tary self, banqueting on lamb (pot roast), rye bread, ripe olives, goats' milk cheese, and red wine.

Later I was conducted to another and smaller building, placed over the monks' little terraced gardens, on the steep slope of the mountain. As I discovered, I was the guest of honor and had a whole house to myself.

HOSPITALITY A NECESSITY, NOT A VIRTUE

Hospitality is a virtue common to Greek monasteries, doubly to be appreciated since the inns are wretched and in the villages are often entirely lacking. This hospitality a century ago was not a virtue, but a necessity, for the monasteries had thus to satisfy the Turkish government to avoid being plundered. Happily the tradition persists long after the requirement has ceased.

The lean, unshaven youth who had first met me—he was not a monk, but acted as porter and kitchen boy—said something which I guessed to be the reassuring information that his name was Georgios, and that, having served as butler in an Englishman's family in Athens, he could talk English; the latter confidence he communicated with great pride.

I promptly hailed him joyfully as a gift of the gods, but our friendship was disappointing. Snobbishness, particularly in the wilderness, is not an American vice, yet I could not find that the ex-butler and I had much in common.

My objection to Georgios began early, as I inquired how many monks were then living at the monastery and received the answer, "Yes, oh yes."

"But how many, *how many*, monks are there here?" I asked, speaking very slowly.

"Yes, yes; oh yes."

I made one more attempt, reversing my question, and in conclusion asked if there were "50, 100, how many?"

He hesitated for a moment, looked

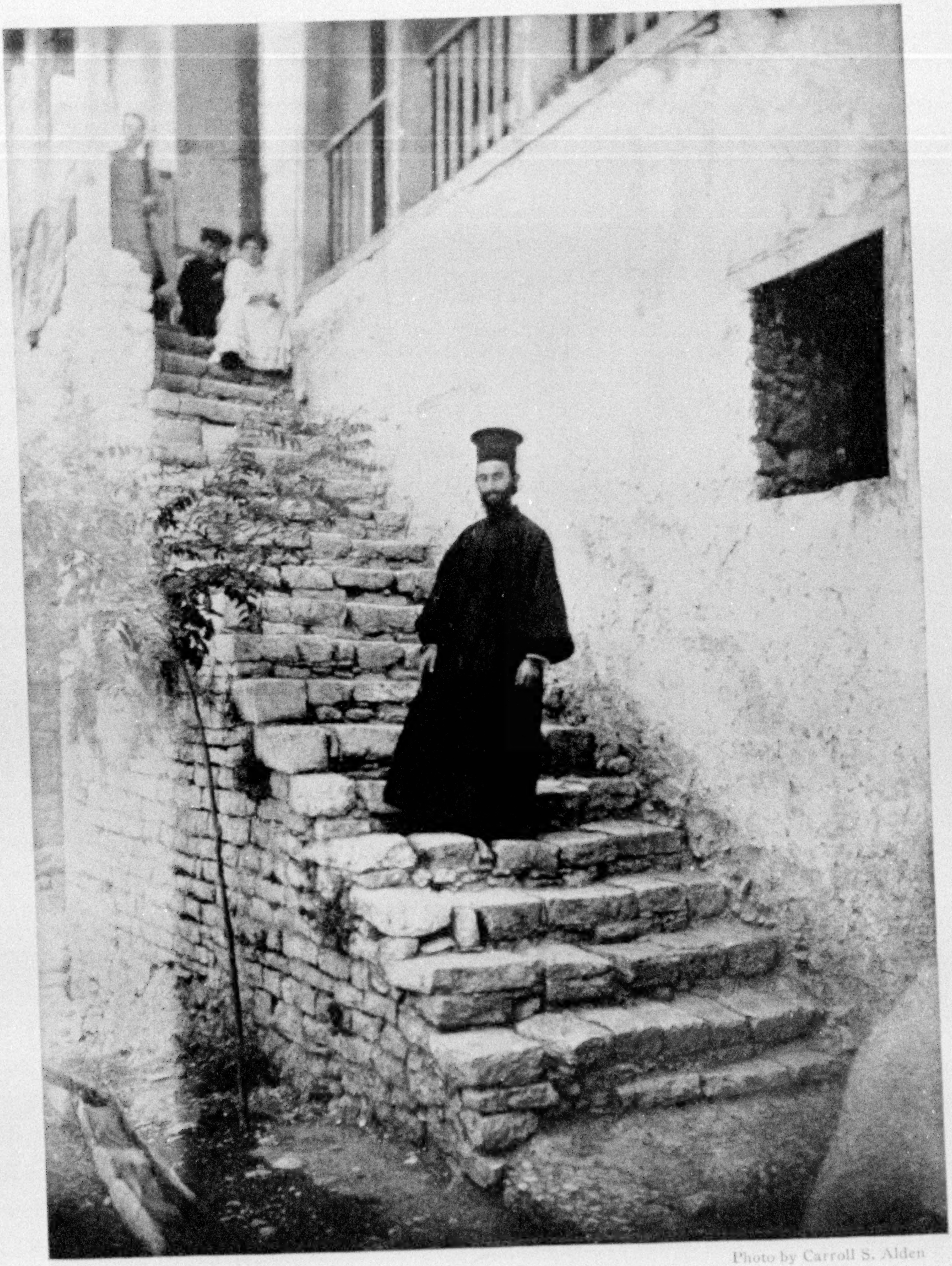

Photo by Carroll S. Alden

THE GUEST-MASTER, OR XENODOCHOS, WHO PROVIDES FOR THE ENTERTAINMENT OF STRANGERS

"The *Xenodochos*, a monk whose duty it is to provide entertainment for pilgrims and visitors, greeted me and soon had brought good cheer in coffee, Turkish style—muddy with pulverized grounds and very sweet" (see text, page 315).

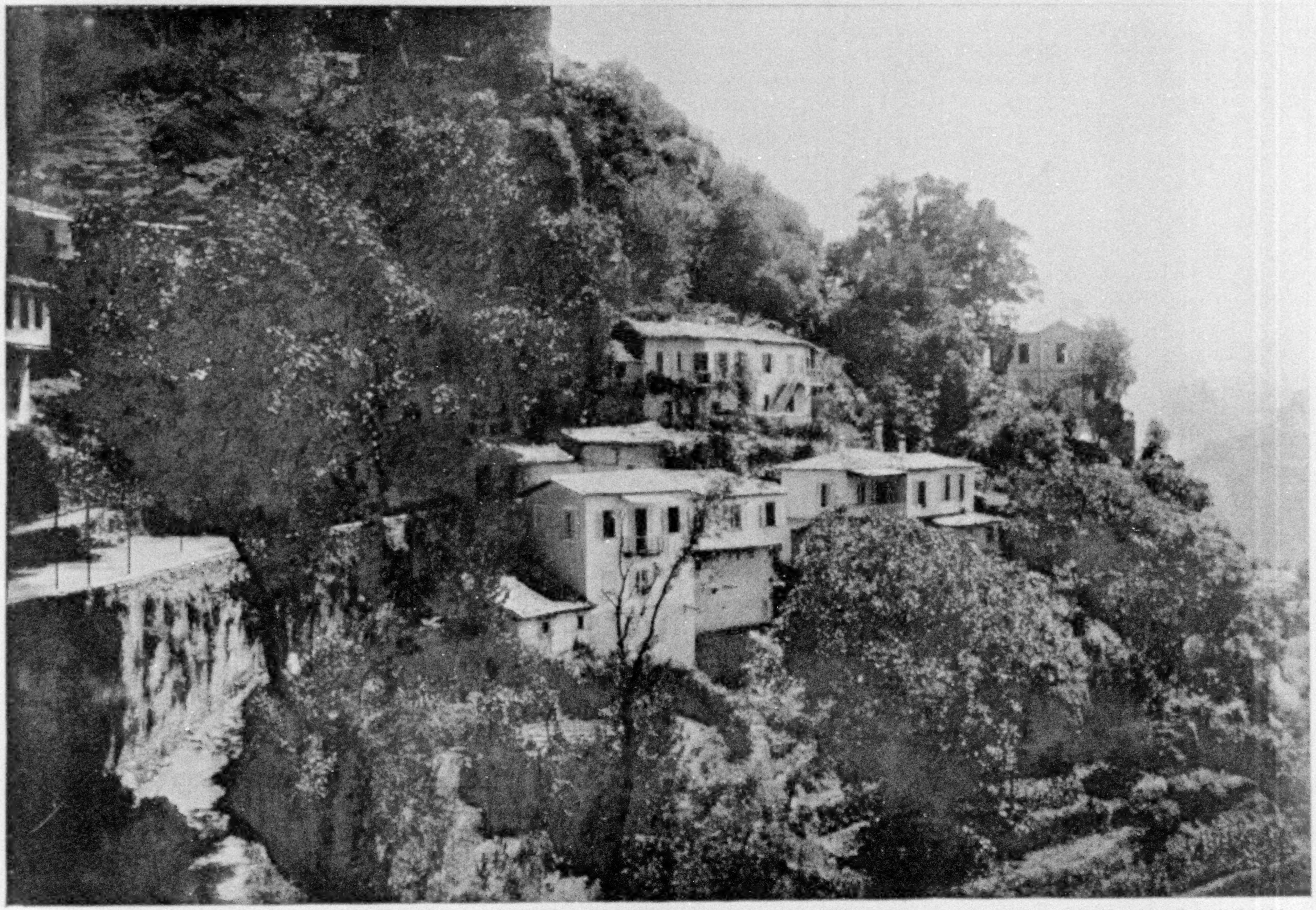

Photo by Carroll S. Alden

THE MONKS' TERRACED GARDENS: THE BUILDING IN THE CENTER AFFORDS QUARTERS FOR THE HONORED GUESTS

"A British minister, Sir Thomas Wyse, who visited Megaspelæon in 1858, well characterized it as a 'great dormitory of religious commonplace, sleeper succeeding to sleeper'" (see text, page 323)

Photo by Carroll S. Alden

MONKS WITH THEIR BREAD AND WINE: NOTE WINE-SKINS HANGING ON THE WALLS

puzzled, and I became hopeful as I saw calm following the severe mental effort; but his answer was the inevitable "Yes, yes indeed; oh yes, oh yes."

WHY A SLEEPING-BAG IS A COMFORT IN GREECE

The bed in the house assigned me had for covering a blanket and one sheet; the latter had grown gray with service, but it compared favorably with accommodations elsewhere; for outside of Athens and three or four other places frequented by tourists, beds in Greece have a bad reputation. Whether in hotel or in private house, they are commonly possessed by small devils. However, a light sleeping-bag I had with me kept out intruders, and I have only pleasant memories of slumbers at Megaspelæon.

The very atmosphere of the place is sleep, and with my windows flung wide, admitting the cooling breath of the mountain, I did not waken till 7 the next morning, when there resounded the pounding of a mallet on a heavy vibrant board—the summons to prayers.

It was Sunday morning, and the half dozen pilgrims who had spent the night at the monastery had been joined by 30 peasants from the country near by. The chapel, 30 or 40 feet square, was crowded near the door and the people were standing. This, the nucleus of the monastery, is, as of old, in a cave, only the chapel is so well walled in and roofed over that I did not at first notice the peculiarity of its construction.

A hundred candles were burning, and the richly jeweled hearts and the somewhat garish ornaments with which the altar screen and walls were studded caught up the gleams. The service to the stranger was dreary and monotonous, nor did the harsh, droning voice of the monk who furnished the music make it less so.

There is at Megaspelæon an object greatly venerated by all devout Greeks, a painting almost black because of its age

Photo by Carroll S. Alden

A GROUP OF PILGRIMS AND PEASANTS AT MEGASPELÆON: NOTE THE NATIVE COSTUME OF THE PEASANT IN THE CENTER OF THE GROUP

"After breakfast I gathered the pilgrims and people who had come up for the morning service for a picture. Most of them were as pleased as children, and they joked and jostled one another as they took their places, as any American holiday crowd would do under the same circumstances" (see text, page 323).

Photo by Carroll S. Alden

A MONK RETURNING FROM WORK ON THE MOUNTAIN FARM

and its exposure for centuries to smoky candles. It is of the Virgin and Child, and is ascribed to Saint Luke, for tradition says that Luke was a painter as well as a physician, and that this picture he made from life.

Some of the Greeks affirm that the images in this marvelous picture spoke plainly to them during the war of independence, weeping at times of defeat and encouraging them with the promise of ultimate victory. It is certain that the painting is very old; Murray in his Handbook dates it from the 8th or 9th century.

After the service a man whose duties were about the same as Georgios' showed me over the monastery. As he was not an accomplished linguist like Georgios, we got on well together. He understood my explanation of what my camera was for, and he took me down long passages, dark as night, past the monks' cells, up a crazy, creaking stairway that uttered a long complaint of old age and weariness, until we reached the very top.

A young monk who had one of the better rooms happened to pass, and my cicerone induced him to play the host. Dionysos (the young monk had the most pagan name) was scarcely more than a boy, perhaps 17, and his beard—the invariable sign of the Greek priest and his chief pride—was just beginning to appear. His cheeks were thin and lacking in color, and his long hair gave him almost a feminine appearance. His countenance expressed, as I fancied, something of sadness and disappointment, but as I told him I wanted a picture of him and his room it lighted up responsively.

I saw him for only a few moments, but if the first impression is to be relied on the lad possessed rare qualities; he needed only inspiration and a great purpose to bring them out.

THE WINE TUNS OF THE MONASTERY

Having been to the summit of the monastery, we next proceeded to the very depths, catching a glimpse in passing of the library, a small room with one

Photo by Carroll S. Alden

DIONYSOS IN HIS CELL

gloomy window, as I judged but little used; but if the monks have nothing of a library it may be remarked that books and learning are not their specialty. After groping along a pitch-dark passage we descended into a huge, cobwebby cavern in the mountain, where water was dripping in a dozen places from the rock ceiling and the sides.

Here I saw what certainly could not be regarded as commonplace, for there were gigantic tuns of wine that would have been a credit to Heidelberg. It is in their wine cellar that the monks of Megaspelæon excel, and as I watched two monks who had brought the pilgrims down here and heard them explaining what I could easily guess was the extraordinary capacity of the tuns and the excellent quality of the wines, I observed a flash of pride and enthusiasm such as nothing else had elicited.

On the stairs we had met the keeper of the cellar—a rough, square-built fellow—carrying on his shoulder a wine-skin which he had just filled and was taking up for the morning's distribution. In the hall above, where there hung a row of 15 or 20 wine-skins, old and new, the wine was doled out, each monk receiving his pitcher full and also a loaf of rye bread.

The Greeks eat scarcely half what the northern European nations require. The 11 o'clock breakfast was the first meal of the day, and at the monastery consisted of the same articles as I ate for supper the preceding evening. While for this vicinity it was a sumptuous repast, it would have seemed like Spartan simplicity to a hungry German.

When breakfast was about to be served I made a move to join the pilgrims at a large table, for I sought intimate acquaintance with their life. But no, the *Xenodochos* was a stickler on class distinction, and again I had a room and a table all to myself, where I might eat with great dignity and loneliness.

CLASS DISTINCTIONS AND PHOTOGRAPHY

After breakfast I gathered the pilgrims and people who had come up for the morning service for a picture. Most of them were as pleased as children, and they joked and jostled one another as they took their places, as any American holiday crowd would do under the same circumstances. But again I ran counter to prejudices based on class distinctions; three women, somewhat better dressed than the others, together with the aristocratic Georgios, unmoved by my exclamation, *"Photographia!"* refused to be taken with the peasants. However, they were not nearly so interesting and picturesque as their humbler countrymen, and their absence meant no loss.

It seems almost ungrateful for one who has enjoyed the hospitality of the monks of Megaspelæon to speak a word in criticism, yet if the truth be told they are an idle lot and have a bad reputation for honesty.

A striking commentary on the place and the people is that I found each of their little terraced gardens strongly hedged in or fenced off from the main path and from the neighboring gardens. They were to be entered only by gates and the gates were padlocked. Similarly, even in remote parts of the monastery, the rooms were securely locked. What must be the conditions when the faithful have to take such extreme care to guard their possessions from their own number!

THE NEGLECTED STATE OF MEGASPELÆON

Further, the shabby, neglected state of the monastery gives the visitor an unpleasant impression. A century ago, when the monks were under the scrutiny of the Turks, there was reason for their simulating poverty; but now the ruinous condition of their main building, in sharp contrast to their reputed wealth, gives their indifference the character of sacrilege.

A British minister, Sir Thomas Wyse, who visited Megaspelæon in 1858, well characterized it as a "great dormitory of religious commonplace, sleeper succeeding to sleeper." Their building may be taken as an index of the general life of the monastery; all is today much as it has been for centuries, while the sun, the rain, and the winter storm have slowly carried on their work of destruction, making no slight havoc on the miserable wooden upper structure, in the repair of which the inactive monks have employed only the merest makeshifts.

On retracing the path leading to the valley, as I turned and caught my last glimpse of the monastery, in the distance no longer dirty and dilapidated, but thoroughly picturesque as it hung half way up the cliff like a huge swallow's nest, I could not help thinking what a miserable life is that of the monks of Megaspelæon. They send out no missionaries or preachers to the neglected people; they go through their services with considerable indifference; they have no interest in study; they write no books, nor do they, like certain orders in the Roman Church, care for the sick and the poor.

What a living death! Dionysos' pallid face, his sad, yearning expression, and his quick hungry response to a few words of interest still linger in my memory.

Photo by Valdeavellano & Co.

THE AVENUE OF MONOLITHS AT QUIRIGUA

"Through the arches of the palms suddenly appears a group of mounds, still overgrown with masses of foliage, and beyond these an avenue of great stones, carved monoliths, leading to some—as yet—invisible altar or temple. From each pillar stares—impassive, gloomy, or sullen—a gigantic face" (see text, page 331).

MYSTERIOUS TEMPLES OF THE JUNGLE

The Prehistoric Ruins of Guatemala

By W. F. Sands

Formerly American Minister to Guatemala

WITH the opening of the Quirigua ruins in Guatemala a most important addition is being made to the material now available for study of the races which once occupied the low, hot coast land between Copán, in Honduras, through the Guatemala littoral, Petén, and Quintana Roo to Yucatan.

Master races they were as were once the Brahmans in Indo-China. They conquered in easy battle the fever-ridden natives, and lived thenceforth upon the country and its population.

They taught them nothing of their higher civilization, but ground them back to the earth, until inbreeding, idleness, and fever took their toll, and in their turn they were overthrown and perished, leaving nothing but the elaborate monuments and massive buildings which, covered with the mould of centuries of quick springing and quick decaying tropical forest, form the "Indian mounds" so plentiful in this region.

A RACE OF PRIESTLY CONQUERORS

The theory of an alien sacerdotal aristocracy, claiming divine descent because of superior development, and ruling an untutored conquered race, while it offers no suggestion as to origin, may at least explain why no memory of their rule remains among the inhabitants of these regions today. Knowledge of every kind was kept from the subject races, and with the downfall the slave fled from the ancient holy places, and the symbols of arrogance, cruelty, and power were shunned for centuries as an abomination.

It is not necessary to hold with Brasseur de Bourbourg that all these countries (the "Hinterland" of Atlantis) were submerged when the island-continent was destroyed, although his theory is immensely attractive, and that after remaining under the sea for an unknown period they rose once more and were peopled from the highlands.

It is simpler to imagine, as long as we have nothing definite to go on and one man's tale is as good as another's, that some such catastrophe took place as is so charmingly suggested in Sir Hugh Clifford's "Tragedy of Angkor," and that the degenerate rulers of the coast were shown suddenly to their subjects by some attack of the hardier mountain tribes to be no longer irresistible, no longer divine, but only very feeble men, and so were wiped out as utterly and effectually as would have been the first weak settlement on our own shores without succor from the mother country.

AN ENVOY WHO FAILED TO FIND HIS GOAL

Perhaps none of the ruins of America is more accessible now to Americans than those of Quirigua; and yet, though frequently visited, they are among the least known.

John Stevens, in his gossipy "Travels in Central America, etc.," in 1839, has left an excellent account of both Quirigua and its neighbor, Copán, during his wanderings in search of a Federal government sufficiently stable to receive his credentials as American Minister.

Failing in the object of his official mission, he returned north through the Guatemalan highlands, visiting also the ruined cities of Quiché, and so up the ridge of the Cordillera, through Chiapas to Palenque and down to Chichen, Itza, and Uxmal, in Yucatan—a wonderfully beautiful journey and not in any way difficult for a saddle-hardened rider.

Stevens left a valuable record; but his real treasure (aside from the personal reminiscence of the astonishing Carrera, who from a particularly brutal swineherd became a demi-god and one of the ablest rulers Guatemala has known) is the series of admirable drawings by Catherwood, who accompanied him, of all the monuments in both Quirigua and Copán, which remain unexcelled even by photography.

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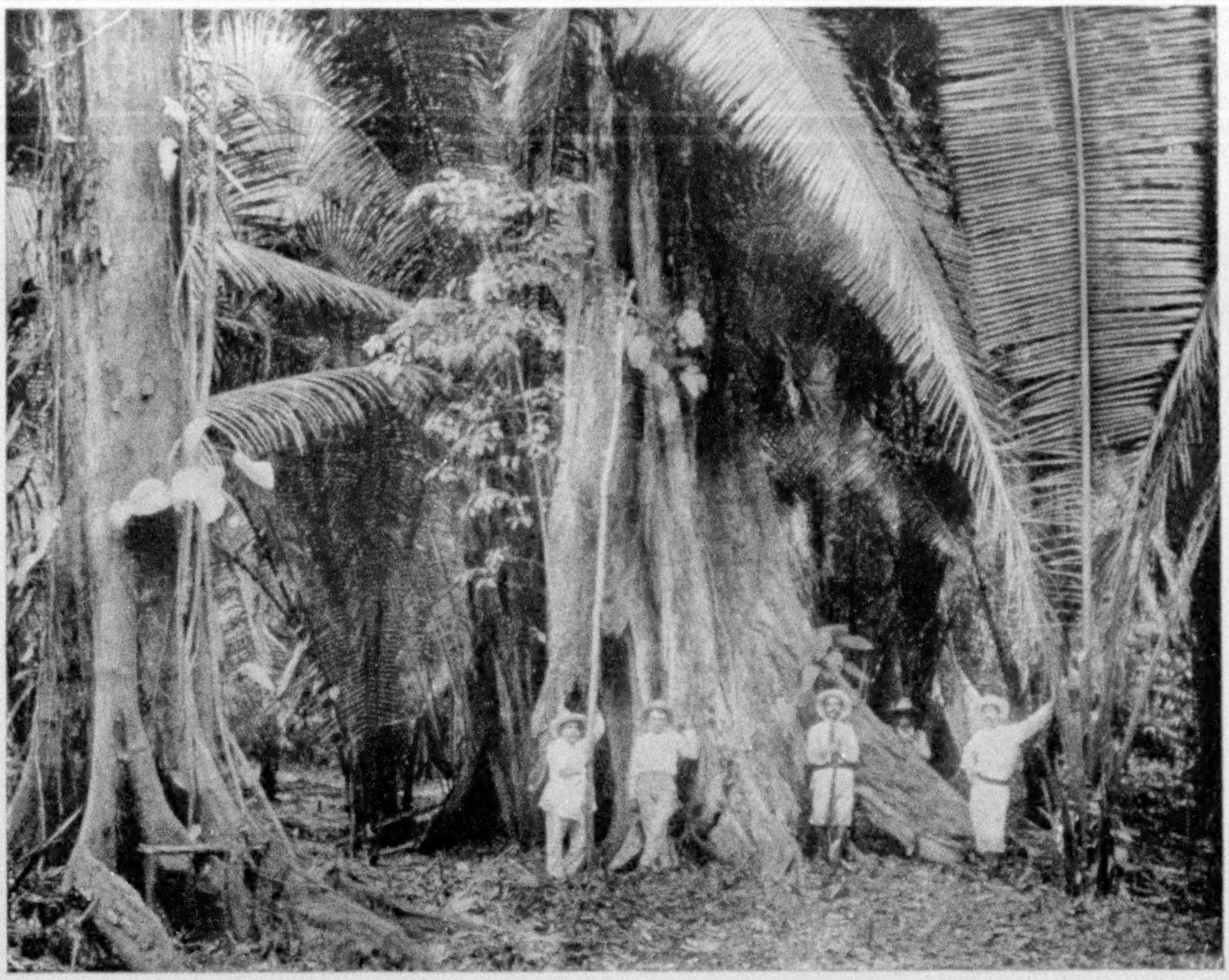

Photo by Valdeavellano & Co.

THE BEAUTIFUL SITUATION OF QUIRIGUA

"The ruins lie on low, flat land, flooded and renewed each rainy season by the Motagua's overflow—rich, inexhaustible alluvial soil, and ideal for banana-growing. A more inspiring spot can hardly be imagined. Under the immense ceiba and other coast trees (70 and 80 feet to the lowest branches, each as big as a 30-year maple and hung with orchids or Spanish moss) has grown up a thicket of palms and fern trees, forming, when the underbrush is cleared, arching forest galleries impossible to describe" (see text, page 331).

Many travelers have passed through since the completion of the railway; but, with the exception of Maudslay, none has attempted to give more than such a description as I am now writing. At present all men are equal, for no one has succeeded in deciphering the historical writings of Quirigua.

THE SITE OF QUIRIGUA CLEARED

In the spring of 1910 the tract of land surrounding the monuments, on the left bank of the Motagua River, was opened for planting by the United Fruit Company of Boston, and a park left about the principal ruins. The company generously supplied labor and many other facilities for clearing this park of underbrush and cleaning the stones, so that at last an organized study was made possible, under the guidance and supervision of Prof. Edgar L. Hewett (Director of the School of American Archeology, at Santa Fé, New Mexico) and of Mr. Sylvanus Griswold Morley (see article by Mr. Morley, pages 339 to 360).

Both of these gentlemen have spent many months in exploration and detailed examination, and under Mr. Hewett's able direction the institute has an opportunity for study hardly paralleled in the history of American archeological research.

Quirigua should become the starting point, the workshop, and the school for beginners in this branch until the gradual

Photo by Valdeavellano & Co.

GREAT BANANA TREES NEAR QUIRIGUA

These banana trees grow to the height of 40 feet, attaining this growth in a period of 18 months. So rich is the alluvial soil of the plain upon which Quirigua stands that the vegetation here grows at the incredible rate of one-half inch every 24 hours.

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development of the country makes organized extension possible into Petén without the hardships and risks to health and life to which sojourners in that beautiful but treacherous country are now subject. Quirigua is free from all these drawbacks, and nothing could be easier than its approach.

The steamer that brings the traveler from New Orleans is only one entire day out of sight of land. The run down the Mexican coast and along the cays and islets of British Honduras is beautiful, with tiny villages white against the forest line and the "Cockscomb" jagged range stretching blue in the distance. From Belize, the capital of the crown colony, it is only a few hours to the Guatemalan border and to the mouth of the Rio Dulce.

This historic waterway (Cortez' road on his superhuman raid from Mexico City to the Honduras coast) opens deep between miles of high wood-hidden cliffs into a vast tide lagoon stretching 30 miles toward the mountains of Vera Paz, "The Land of True Peace" of Las Casas, conquered by him and his Dominican friars when years of fierce fighting had resulted in unvarying disaster and defeat to the Spanish troops at the hands of the warlike Indians.

WHAT THE COAST TOWNS ARE LIKE

Livingston, a Carib town, lies clean and white on a low bluff at the entrance bar, and just opposite, a few miles away by sea, is the real port (Puerto Barrios) more important, but far less sightly, than its neighbor.

Livingston receives the coffee trade from the German plantations of Vera Paz, does a bit of "free trade" on its own account, filibusters and fishes. The soul of the Spanish Main still lives there, and all the game fish of Tampico or Catalina Island are to be found about Puerto Cortez, the next little town, beyond the Motagua River in Honduras, or in the great lagoon above the shady stretches of the Rio Dulce.

Puerto Barrios has a railroad terminal, tank and turn-table, a customs shed, a group of buildings belonging to the United Fruit Company, a barrack for a half company of Carib infantry, and a rotting wooden hotel, all set in a swamp, bridged from house to house by board walks, and made altogether unendurable by mosquitoes. Fortunately one is not obliged to remain in this singularly unattractive place, for the daily train to the capital starts as soon as the passengers are through the customs, and, long before the sun is high, has plunged into a jungle so thick that a dozen paces from the railroad embankment the sun is invisible.

This dense brush is filled with game: the small deer common to America and Asia, herds of peccary (the small wild pig always cited as a model of fierceness in all the good old books of travel and adventure of our boyhood), tapir, an occasional jaguar, and birds of all kinds, some related to our own game birds.

Monkeys were common enough, but the natives say that they died by the hundred, not a great many years ago, of smallpox. I do not vouch for the diagnosis, but I always visit the jungle with a receptive mind.

A few miles beyond this forest primeval villages begin to line the track, which now follows the Motagua River; groups of huts built of four walls of split bamboo stems set upright in the earth, with a floor of split bamboo laid cross-wise and a roof of palm-leaf thatch; some of them are set on the damp and soggy ground and some slightly raised to allow for drainage.

Among these appear others more tidily and securely built of whitewashed plank, inhabited by negroes who come here from the West Indies, Belize, and our own Southern States, attracted by the good pay offered by the fruit company and the railroad. A fair sprinkling of escaped criminals and "bad men" from New Orleans gives to all our American negroes an undeservedly evil reputation on the coast.

THE GREAT BANANA PLANTATIONS

These villages cultivate a little corn, a little fruit, and some gaudy flowers about the huts; but in spite of any attempt at neatness or decoration, they convey only a strong impression of impermanency. Along this part of the river

Photo by Valdeavellano & Co.

A FALLING MONUMENT

These great monoliths, some of which are as much as 26 feet high, were quarried from the foothills two miles west of the city, and were probably transported thither on rafts during the rainy season, when the greater part of the valley is submerged by the overflow of the Motagua River (see text, page 354).

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Photo by Valdeavellano & Co.

WELL-PRESERVED HIEROGLYPHICS

"Each figure is crowned with a tall feather head-dress; is belted with a short embroidered skirt like the sacrificial apron worn by Korean eunuchs in the Heaven sacrifice—naked, with heavy ornaments at wrist and ankle. On the sides of the stones are columns of glyphs, until now undeciphered, but nearly all plain and well preserved, and, when the clue shall have been found, easily legible" (see text, page 331).

between the bank and a ridge of hills, covered partly with tropical growth and partly with sickly pines, the banana plantations of the Boston company cover 18,000 acres, mostly developed in the last five years.

In place of the jungle belt, through which I passed on my first visit to Guatemala, are well-ordered sections or "farms" tapped by spur lines of the railway, each fed in its turn by Decauville roads. Each farm is overlooked by the superintendent's house, built like those designed for the Panama Canal workers, well above the ground, with broad porches, screened and mosquito-proof.

The company has of late preferred young college graduates as farm superintendents, and the station name often indicates the founder's school. In the center of all, set in a too-luxuriant rose garden, surrounded by labor villages, shops, storehouses, offices, and "bachelors' quarters," lies the big, comfortable house of the young manager, under whom this extraordinary growth has been attained.

A few miles beyond, 57 from Puerto Barrios and 2½ from the railroad, toward the river, lie the ruins of Quirigua, from the beginning of last year open country like that below, planted with banana "eyes" like a vast potato field, with a lively camp of some 1,800 laborers preparing still more acres.

THE BEAUTIFUL SITUATION OF QUIRIGUA

The ruins lie on low, flat land, flooded and renewed each rainy season by the Motagua's overflow—rich, inexhaustible alluvial soil, and ideal for banana-growing. A more inspiring spot can hardly be imagined. Under the immense ceiba and other coast trees (70 and 80 feet to the lowest branches, each as big as a 30-year maple and hung with orchids or Spanish moss) has grown up a thicket of palms and fern trees, forming, when the underbrush is cleared, arching forest galleries impossible to describe.

From the ceiba and mahogany trees drop long, leafless, snake-like black vine stems—one, the "water-vine," containing a quart of clear, pure water to every foot, which spurts forth in a refreshing stream when cut. It is a real, thirst-quenching water, drawn up from the soil and filtered through the pores of the plant; not a sap, as one might suppose. As is generally the case, this vine grows thickest where the surface water is least drinkable.

Through the arches of the palms suddenly appears a group of mounds, still overgrown with masses of foliage, and beyond these an avenue of great stones, carved monoliths, leading to some—as yet—invisible altar or temple. From each pillar stares—impassive, gloomy, or sullen—a gigantic face. Each figure is crowned with a tall feather head-dress; is belted with a short embroidered skirt like the sacrificial apron worn by Korean eunuchs in the Heaven sacrifice—naked, with heavy ornaments at wrist and ankle.

On the sides of the stones are columns of glyphs, until now undeciphered, but nearly all plain and well preserved, and, when the clue shall have been found, easily legible. The faces are well carved, of a heavy, full type, with thick lips, narrow eyes, and thin, carefully pointed Egyptian beards, like the Sargent Pharaoh in the Boston library. Several show a remarkably cruel strength, which lessens with each set of pillars to a weak, purposeless, degenerate type—loose-lipped, chinless, and imbecile. Among them is to be found the most perfect pieces of carving I have yet seen among American antiquities (see pages 333 and 342).

CENTERS OF A GREAT CIVILIZATION

It is not to be supposed that either this place or Copán was an isolated group of temples. It is more likely that they were centers, and that more similar, if less perfect, remains will be uncovered in the near future in the course of deforestation preliminary to banana planting.

There is no reason to suppose that the aboriginal dwelling was in any way superior to the bamboo and thatch structures I have described above—than which nothing could well be more perishable. The Motagua Valley and adjacent territory may have been and probably was densely populated about these sacrificial foci; but with the overthrow and savage

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Photo by Valdeavellano & Co.

A MAYA CALENDAR

At the close of each hotun, or 1800-day period, at Quirigua, one of these monuments was erected. The hieroglyphics carved on the sides probably record the principal events of the corresponding period in each case.

Photo by Valdeavellano & Co.

THE CURIOUS EGYPTIAN TYPE

"The faces are well carved, of a heavy, full type, with thick lips, narrow eyes, and thin, carefully pointed Egyptian beards, like the Sargent Pharaoh in the Boston library. Several show a remarkably cruel strength, which lessens with each set of pillars to a weak, purposeless, degenerate type—loose-lipped, chinless, and imbecile" (see text, page 331).

Photo by Valdeavellano & Co.

TWO INTERESTING FRAGMENTS

The disc to the left shows a figure in profile, which bears a strongly marked resemblance to the types we are familiar with in the ancient Egyptian monuments. This resemblance affords one of the arguments for the theory that this part of America once formed part of a continent called Atlantis, which was peopled by a race closely related to the ancient Egyptians. The figure on the right is a fragment of one of those animal forms which are so common in Maya antiquities.

annihilation of the last of the priest-kings and the flight of their emancipated but terrified subjects to the higher valley of the same river about Gualán and Zacapa, no trace would remain of any but the most substantial buildings, the temples and palaces. "Indian mounds" are frequently reported in all this region and have been known for many years to the adventurous spirits who have prospected for gold, railroads, mahogany, game, or "treasure" in these uninhabited forests.

These lie, according to such statements, along the river and in the hills toward the Rio Dulce and the lagoon, with a general trend from Copán to Petén. Some lie in the upper Motagua Valley as far as the foot-hills above Zacapa. The railroad crosses the Motagua a few miles above Quirigua, forced to the right bank by the line of low hills it has followed from the coast.

Almost from the crossing the country begins to change. It becomes less swampy; the river bed grows rocky and no longer flows through deep banks of black earth; it acquires the greenish tinge of mountain streams; and the foliage on the banks, while not less thick, is drier and shows a less feverish green.

Above Gualán (perched picturesquely on a hilltop) the valley opens into a rainless, dusty, cactus-grown plain like northern Mexico or Arizona, surrounded by high bare mountains and watered by two fine rivers—the Motagua still and an affluent, the Zacapa. It is well populated; corn and cotton grow well, and cattle appear to prosper.

Yellow fever, having once got a hold upon this region, has become endemic, but I know of no place whence it might more easily be banished, and, cleaned thoroughly, these towns should be as healthy as any.

The inhabitants are of the "Ladino" class, the Spanish-Indian hybrid, which has, in the course of centuries, become a fixed type. They have a good idea of the possible value of their land, dry and dusty as it is, and will not sell at any price; nor are they in error. Barrage and pumping works installed in the Zacapa River—far beyond the power of native capital, it is true, but of easy construction for some American syndicate—would make of this plain the richest sugar region in the world. Cane needs heat and unlimited water, but neither wind nor rain. The burning Zacapa plain is sheltered from both, and has an inexhaustible supply of water from the rivers.

A PREHISTORIC MINING CENTER

There is every indication that this region was once as thickly peopled as any part of the country. Records of the missionaries who came after the Spanish conquest tell of large towns here and flourishing villages, and it may be that gold or silver workings gave to the overshadowing range the name it bears, of "Mountains of the Mines." Whether or not this upper valley of the Motagua was peopled from below might still be determined from the relics which remain.

These investigations, however, should be undertaken promptly before the development of all this country by investment of American capital and intensive cultivation has so altered its face that all record is lost. A connection between the upper and the lower Motagua Valley—that is, between the Zacapa Valley and the coast—seems to me to be more logical and natural than a relation between this region and the highlands.

Of the plateau cities destroyed by Alvarado sufficient record is still available to make comparatively easy an exhaustive study of the Quiché, Kakchiquél, and other tribes or nations of the mountains and of the Pacific coast. Rulers and people seem to have been of the same stock, and after their overthrow by the Spaniards and their Tlascalan allies, the survivors did not disappear; they rose again and again and fought their conquerors as long as there remained a chief to lead them.

DO THE INDIANS PRESERVE THEIR TRADITIONS?

The traditions of the ancient people, their religion, and their feeling of nationality may still live in the heart of the Quiché Mountains, and might be easily studied by one who would devote a num-

Photo by Valdeavellano & Co.

THIS MONUMENT, STELA F, IS ONE OF THE MOST BEAUTIFUL OF ALL THE HOTUN-MARKERS AT QUIRIGUA

It is 25 feet high above ground and is elaborately carved from top to bottom. It records the date 9.16.10.0.0.1 Ahau 3 Zip of Maya chronology, or approximately 490 A. D.

Photo by Valdeavellano & Co.

SIDE VIEW OF THE MONUMENT CALLED STELA K

The hieroglyphic inscription shown here records the date 9.18.15.0.0.3 Ahau, 3 Yax of Maya chronology, or approximately 535 A. D. Stela K was the last of the great monuments to be erected at Quirigua, the following hotun, or 5-year period (540 A. D.) being marked by the erection of Temple A.

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ber of years of his life to acquiring their language and observing their customs and their prejudices, and who would make it his first care to treat them like human beings rather than savages (which, distinctly, they are not), or like beasts of burden. They are not emancipated yet from their martyrdom of centuries; since Bartolomé de las Casas they have had no protector. The republic has done nothing for the Indian, yet they are the finest stock in the country and in them lies the future of Guatemala.

To help him the student will find many treasures in the government archives and valuable historical documents in private collections. Much has found its way out of the country, and it is to be hoped that it is in the hands of some one who will realize the importance to history of these old manuscript books and records and will give it to the world.

The climate during the dry season (on the high plateaus, from October or November to March) is delightful; the high mountain valleys, pine and corn clad, with their soft-toned, well-shaded villages and towns; the true hospitality and gentleness of the people (once one has gained their confidence and affection) make an ideal setting for a winter's work.

The roads are only navigable for bullock-carts, it is true, but a mule or a good native pony will pass anywhere, in spite of bottomless ruts and spring holes. With a good animal, road traveling in Guatemala is, in my experience, unsurpassed for beauty except by the mountain paths of Korea.

There is also a dry season on the coast of which advantage may be taken, and will be taken, I hope, for several years to come, to complete the Quirigua work. When the mud has dried and the ever-vigorous underbrush has been cut from the park surrounding the monuments, a few weeks spent among them is not only not dangerous, but not unpleasant and would certainly be immensely profitable.

EXPLORING, BUT IN TOUCH WITH CIVILIZATION

As I have attempted to point out, the student is not lost in primeval jungle, but works near a camp which is the center and headquarters of the United Fruit Company's operations. He has but to follow their axemen every morning as they open new territory, and is at all times within easy range of tobacco, clean linen, magazines, good food, and, at the worst, of pills, American doctors, and hospitals.

With the coöperation of the government of Guatemala lies open to the Institute a work of vast importance to American archeology, under conditions—I was about to say—of luxury, and I think that the expression is well justified if comparison be made with any other American work of this character.

Nothing should be spared, in funds or men, to make Mr. Hewett's undertaking a complete success and establish the work in Guatemala upon as permanent a basis as that of San Juan Teotihuacan, in Mexico.

EXCAVATIONS AT QUIRIGUA, GUATEMALA

By Sylvanus Griswold Morley

Assistant Director Quirigua Expedition, 1912

THE ruins of Quirigua are located in the Republic of Guatemala, Central America, 57 miles from the Caribbean Sea. The heart of this ancient city, its civic and religious center (see map on page 349), covered about 75 acres, surrounding which on every side for a distance of several miles were the dwellings of the common people.

Quirigua was one of the older centers of the great Maya civilization, which flourished in southern Mexico, Guatemala, and northern Honduras during the first 15 centuries of the Christian Era. Judging from the dated monuments (see page 337) which were erected in its several courts and plazas, this ancient American metropolis was abandoned during the first half of the 6th century A. D.

Toward the close of the 6th century the Mayas moved out from the older centers of their civilization in the south and migrated northward into Yucatan. Here in the stress of colonizing a new and unfamiliar land the remembrance of their former homes gradually faded, until Quirigua, along with many another southern city, became only a memory, a tradition. Finally, long before the discovery of America, even the tradition of its former existence had passed from the minds of men.

QUIRIGUA LOST FOR CENTURIES

Hernando Cortez, the conqueror of Mexico, must have passed within a few miles of Quirigua in 1525, on his memorable march to the Golfo Dulce, but he

Photo from Sylvanus G. Morley

THE FIRST STEP IN EXCAVATING TEMPLE A WAS TO REMOVE THE SURFACE STONE

A line of native workmen are here shown passing the fallen building blocks down to the dump car. An assistant stands at the car to see that no sculptured stones are thrown away

Photo by Valdeavellano & Co.

THIS MONUMENT, KNOWN AS ZOOMORPH G, REPRESENTS THE JAGUAR, OR AMERICAN TIGER

The bulging eye, yawning mouth, and clawing fore-leg appear very clearly in the accompanying photograph. The jaguar plays a very important role in Maya mythology, and its skin was extensively used as a priestly vestment. Priestly figures, with jaguar skins hanging from their shoulders, are represented in bas-reliefs from every part of the Maya area.

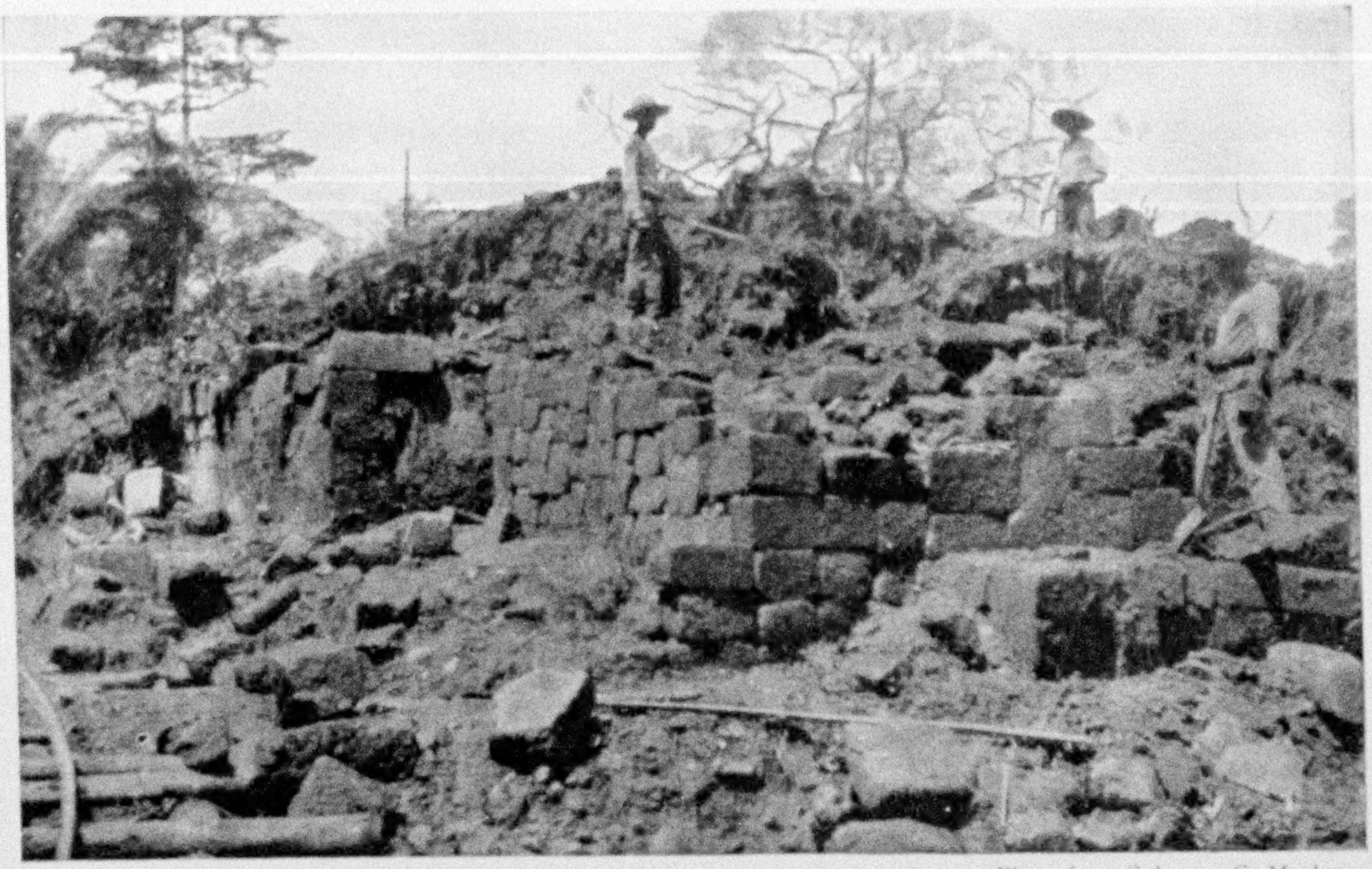


Photo from Sylvanus G. Morley

EXCAVATING TEMPLE A

Exposing the southeast corner after it had been buried for more than 15 centuries

makes no mention of the fact, and it was not until over 300 years later, or in 1840, that the site was again made known to the world by Stephens and Catherwood.*

During the centuries which had elapsed since its abandonment a dense tropical vegetation (see page 348) had overgrown the city, overthrowing its temples and palaces and reducing them to shapeless mounds of fallen masonry.

The jungle had won its way into the different courts and plazas; and these public squares, once teeming with the life of a populous community, had become the haunt of the tiger, peccary, monkey, ant-eater, and the infinite host of the tropical forest. The jungle had again reclaimed its own.

In 1909 the United Fruit Company, incidental to the purchase of a large tract of land in this vicinity for a banana plantation, acquired title to the site, and in the following year, through an arrangement with the School of American Archeology, the systematic study of the ruins was undertaken under the direction of Edgar L. Hewett.

DIFFICULTIES IN CLEARING THE SITE

The archeological investigation of Quirigua presented many new and difficult problems. Before digging could be commenced, it was first necessary to fell the all-enveloping jungle.

Giant trees, often exceeding 150 feet in height, had to be removed occasionally from the midst of a cluster of elaborately sculptured monuments, where a single blow from a falling branch might have shattered the high relief and done irreparable damage.

In such delicate cases the trees first had to be cabled, and then, while they were being cut, gangs of native laborers pulled them away from the endangered monuments.

All this preliminary work consumed much time, and it was not until February of last year that the actual excavation of the site was commenced.

The place selected for the first season's digging was the south side of the temple court, at the points marked A and B on the map, on page 349; and at A a trestle

* "Incidents of Travel in Central America, Chiapas, and Yucatan." John L. Stephens. Harper & Brothers, 1840.

Photo by George N. Bucklin, Jr.

THIS IS ONE OF THE BEST-PRESERVED MONUMENTS AT QUIRIGUA AND IS KNOWN AS STELA D

The relief is very slightly weathered and looks as though it had just left the sculptor's chisel. The Egyptian type of face, with its characteristic little beard, shows very distinctly in this monument. Compare, also, the monuments shown on pages 333 and 334.

Photo from Sylvanus G. Morley

DETAIL SHOWING A HEAD AND HEAD-DRESS ON ONE OF THE LARGE MONUMENTS

The "cross-bone" decoration on each side of the head-dress is a common motive in Maya art

XUM

Photo from Sylvanus G. Morley

A SINGLE CARVED STONE REPRESENTING SOME CREATURE, PROBABLY A TORTOISE, AND KNOWN AS ZOOMORPH P

This monument weighs over 50 tons and is said to be the finest piece of aboriginal sculpture in the Western Hemisphere. Every available inch of its surface is elaborately carved, the relief being over a foot in depth in some places

SIDE VIEW OF "THE GREAT TURTLE," OR MONUMENT CALLED ZOOMORPH Z

If this picture be turned upside down, a fine head in profile will be seen just to the left of the center

Photo from Sylvanus G. Morley

A MATAPALO TREE

This tree when young grows around some other tree, clinging to it for support. As it grows it gradually surrounds the tree supporting it, and finally ends by choking it to death; hence the name matapalo, or "kill-tree." It is no uncommon sight in the vicinity of Quirigua to see two entirely different foliages emerging from the same trunk. The matapalo illustrated here has succeeded in entirely surrounding the tree which originally gave it a helping hand upward.

Photo from Sylvanus G. Morley

SCULPTURED FRAGMENTS OF STONE FOUND AROUND THE BASE OF TEMPLE A: NOTE THE CURIOUS VARIETY OF BIZARRE DESIGNS

and tramway were built for carrying off the excavated material (see page 339).

Surmounting the broad and spacious terrace which forms the southern side of the temple court was a large mound. A (see page 348), which, from its size and location, seemed to be the remains of a very important construction.

Fragments of sculptured stone, human and grotesque heads, hands and feet, feather-work and geometric forms, and parts of a hieroglyphic cornice strewed the ground on every side (see page 352), and the first trenches brought to light much additional material of the same character.

AN IMPOSING TEMPLE FOUND

As the work of excavation proceeded there gradually developed from this mound of earth and fallen stone the ground plan of what had originally been an imposing temple. This temple (see the ground plan on page 355) was found to be 105 feet long and 29 feet wide.

It is composed of seven chambers, symmetrically arranged, the three larger ones of which, those opening to the outside, are 14 feet long and about half as wide.

The four interior chambers, alternating with the preceding, are somewhat smaller, being only 9 feet long by 5 feet wide. The floors of the smaller chambers are in every case a foot and a half higher than the flooring of the large chamber from which they are entered; and, similarly, the floors of the larger chambers are again 2 feet higher than the floors of the spacious doorways giving into them. In the latter case the rises of the steps are sculptured with hieroglyphics, drawings of which are shown on page 356. Successive stages in the excavation of the middle chamber of Temple A are shown on pages 350 and 351.

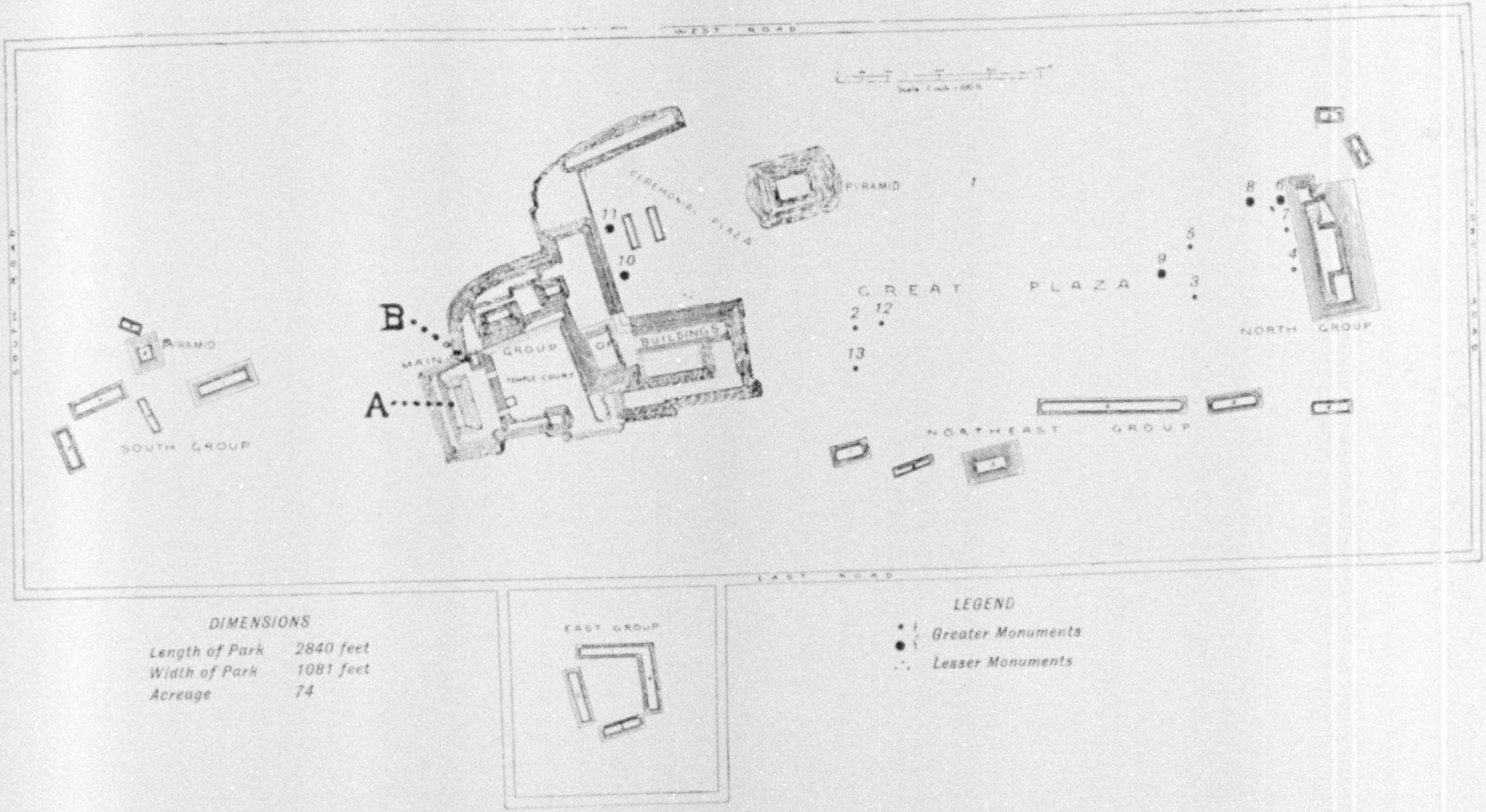
This chamber originally had three heads tenoned into its back wall at a height of 5½ feet above the floor (see bottom row on page 354).

This unusual feature of decoration doubtless indicates a chamber of corresponding importance, which its central

Photo from Sylvanus G. Morley

VIEW OF THE TEMPLE COURT, LOOKING SOUTH, BEFORE EXCAVATION

The mound in the background and the low mound just to the right of it are Temple A and Structure B respectively, before excavation. The view of this same side of the temple court after excavation is shown on page 353



MAP OF THE RUINS OF QUIRIGUA, GUATEMALA

The structures excavated last winter are marked A and B on this map

Photo from Sylvanus G. Morley

EXCAVATING THE CHIEF SANCTUARY OF TEMPLE A: (1) CLEARING THE DOORWAY

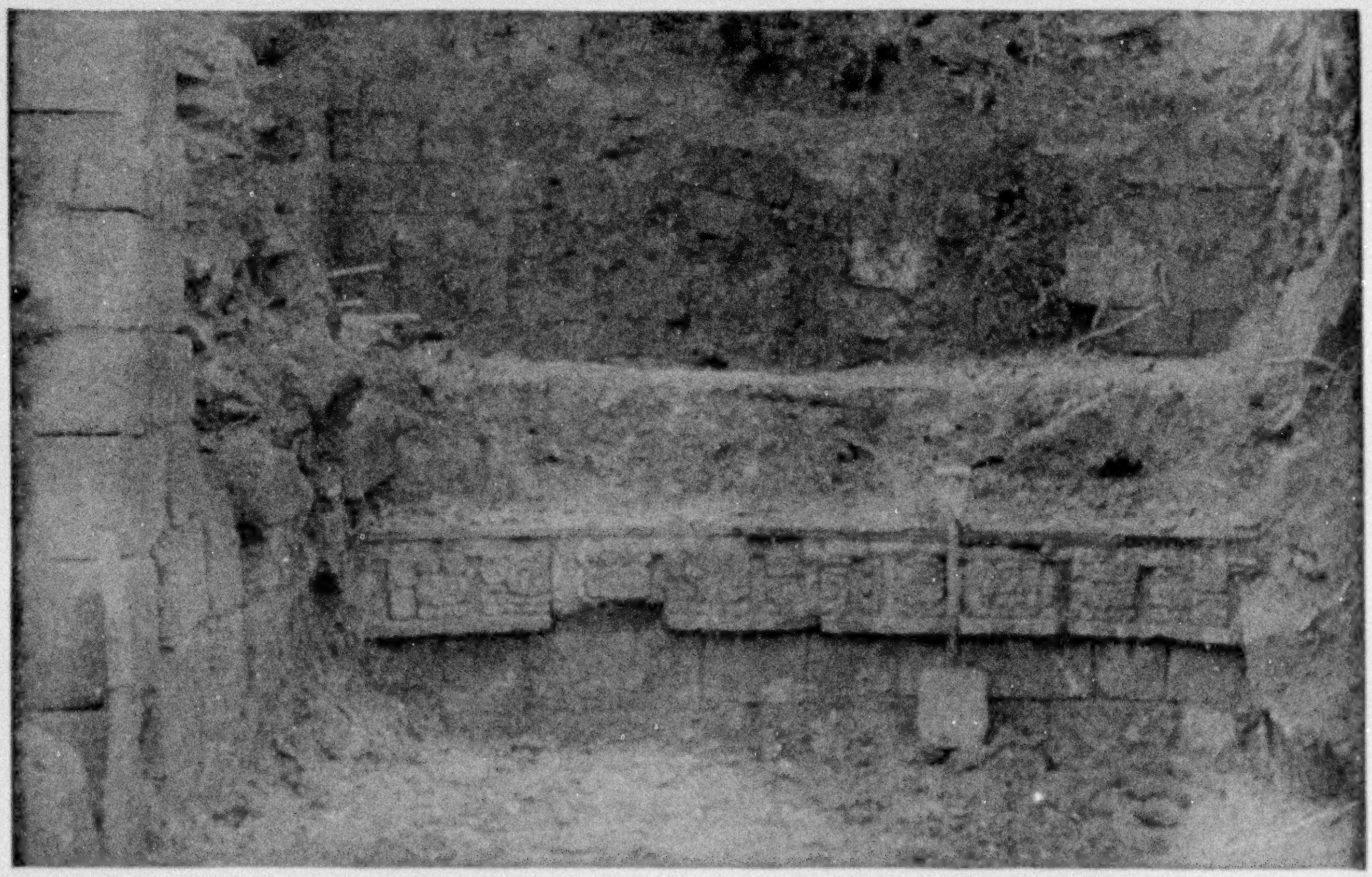


Photo from Sylvanus G. Morley

EXCAVATING THE CHIEF SANCTUARY OF TEMPLE A: (2) THE SANCTUARY PARTIALLY CLEARED

The back wall of the sanctuary has been partially uncovered and the threshold cleaned out, exposing the hieroglyphic step (see page 356). The three heads in the bottom row of the picture on page 354 were found in the layer of dirt on the floor of this room.

Photo from Sylvanus G. Morley

EXCAVATING THE CHIEF SANCTUARY OF TEMPLE A: (3) THE SANCTUARY AFTER FINAL REPAIR

Note that the wall to the left has been relaid in cement, and the third hieroglyphic, part of which is missing in plate 2, on page 350, has been repaired, the missing part having been found in the debris on the floor of the doorway.

position in the building further corroborates. Indeed, it is more than likely that this chamber of the tenoned heads was not only the chief sanctuary of this particular temple, but of the whole city as well.

A SHRINE FOR HUMAN SACRIFICE?

It requires but little effort of the imagination to picture once again the rich and varied scenes which had this temple for their background. White-robed priests, with jaguar skins hanging from their shoulders, ascend the stairway to the sanctuary. Garlanded victims in the shadow of death tremble at the altar.

Gorgeously plumed chieftains pace the broad terraces or press around the covered dais of the city's ruler, while below, thronging the stone seats along the sides of the court, the multitude, in ignorance and awe as always, awaits the sacrifice. All the pomp and pageantry of the bygone days again fill the court under the magic spell of the romantic surroundings.

Curiously enough, the excavation of this sanctuary failed to bring to light a single specimen, not even a potsherd, although the interior chamber adjoining it on the right yielded a generous return.

Among the specimens recovered from this latter room were two very fine flint spear-heads, each over 6 inches in length, and the fragments of a dozen or more pieces of pottery, which show a variety of pleasing shapes and designs. In general, the Quirigua ware is red, or red and yellow, and of a basin-like shape. Many pieces have three legs, the legs being made of balls or inverted cones of clay.

Photo from Sylvanus G. Morley

FRAGMENTS OF THE MEDIAL AND UPPER CORNICES OF TEMPLE A

In the foreground appear several blocks from the hieroglyphic cornice, which divided the facade into two horizontal bands. Behind are blocks from the upper cornice, showing the leaf or feather pattern.

Decoration was largely confined to the exteriors, and was effected by fluting, painting, and incising. It has been suggested that the first of these was derived originally from the calabash, which abounds in the vicinity. The yield of specimens from the other chambers of Temple A was rather meager, all combined being less than the cache just described.

THE TEMPLE CONFORMS TO MAYA TYPE

The façade of Temple A, like that of all Maya structures, was divided into two parts by a cornice which passed around all four sides of the building half way between the top and bottom.

In Temple A this cornice was composed of a band of hieroglyphics which began at the northeastern corner and extended clear around the building. Below this cornice the façade was plain, being without sculptural decoration of any kind.

This severe treatment of the lower panel offered a striking and effective contrast to the upper panel, which was composed of an elaborate mosaic of sculptured stones finished at the top with another cornice showing a leaf motive.

Unfortunately the upper part of the building has suffered most, having fallen at every point, carrying with it all of this sculptured mosaic, not a single stone of which now remains in its original position. This appears very clearly in the picture on page 357, which shows the front or north side of Temple A.

The walls up to the hieroglyphic cornice are perfectly plain. At the left, where the inscription begins and where the sequence of the first 15 or 16 hieroglyphics is known, the cornice has now been restored to the position it originally occupied.

SOME HIEROGLYPHICS DECIPHERED

The hieroglyphic inscription presented on the exterior cornice and on the rises of the steps in the three exterior door-

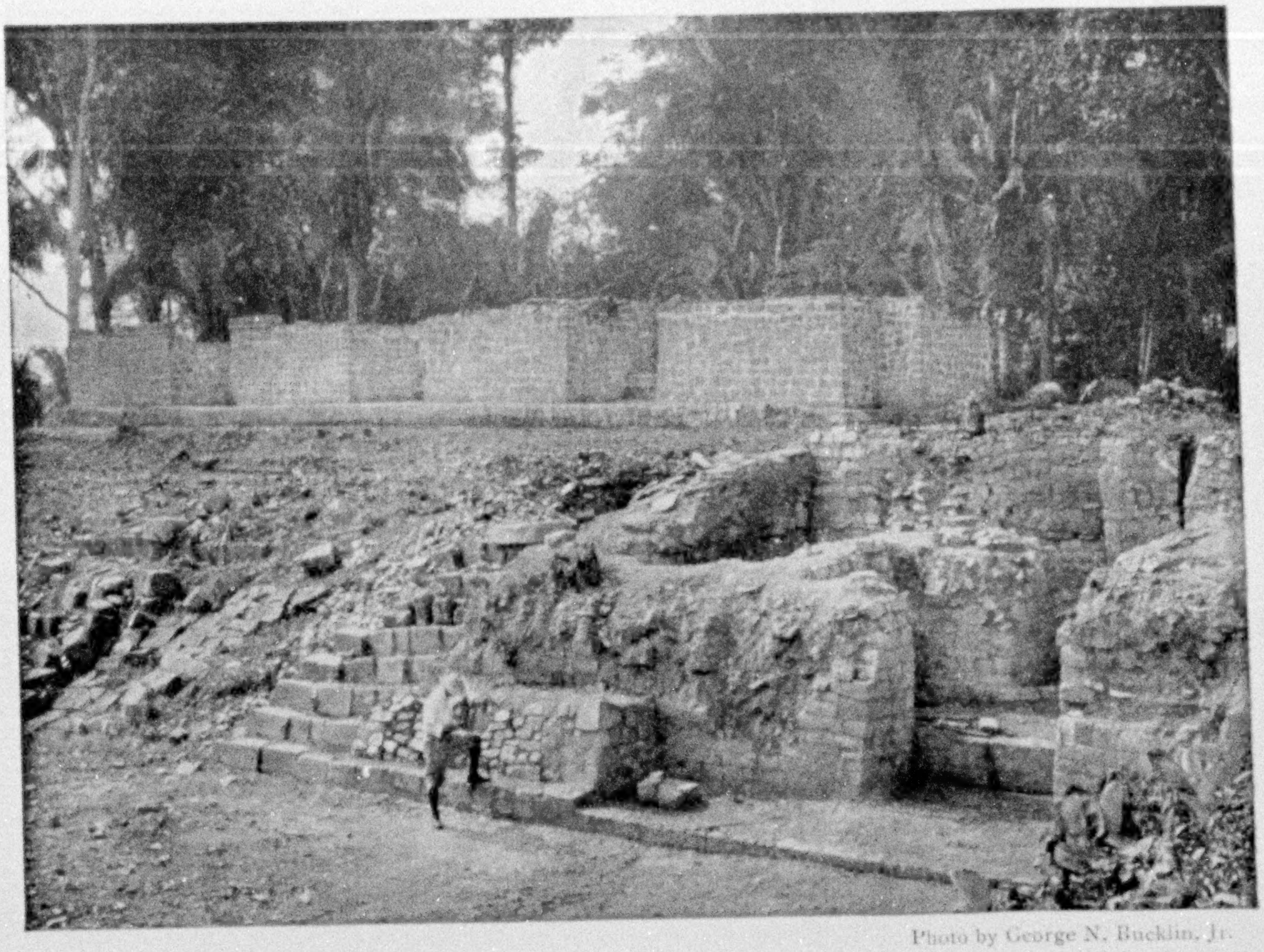


Photo by George N. Bucklin, Jr.

VIEW OF THE SOUTH SIDE OF THE TEMPLE COURT AFTER EXCAVATION: CONTRAST WITH THE VIEW SHOWN ON PAGE 348

ways of this temple is of unusual interest. The text on the cornice records the date 9.19.0.0.0:9 Ahau, 19 Mol of Maya chronology, which corresponds approximately to the date 540 A. D.*

This date doubtless indicates the time at which Temple A was erected or at least dedicated. It marks the close of Katun 19 of cycle 9 of the Maya era† and is the latest of all dates yet discovered at Quirigua.

The first two hieroglyphics in the eastern doorway (*a* and *b*, on page 356) record the date 9 Ahau 18 Mol, which is exactly 40 days in advance of the date presented on the outside. The third hieroglyphic in the middle doorway (*c*, on page 356) expresses this distance of 40 days, and the fifth and sixth hieroglyphics, *e* and *f*, the date 9 Ahau 18 Mol, recorded also on the cornice outside.

Finally, the seventh and eighth hieroglyphics in the western doorway, *g* and *h* (page 356), declare that this day, 9 Ahau 18 Mol, was at the end of Katun 19 of cycle 9, thus repeating the information given on the exterior of the building.

WHAT DO THE HIEROGLYPHICS HIDE?

It will be seen from the foregoing that the only Maya hieroglyphics which have been deciphered up to the present time are those which deal with some phase of the calendar, such as day, month, or period, signs, and the like.

Indeed, all told, the meanings of not more than 50 different characters have been worked out, leaving in the neighbor-

*Authorities differ as to the exact correlation of Maya and Christian chronology. The correlation used here is that proposed by the writer.

† The Maya Katun contained 7,200 days, or approximately 19¾ years. There were 20 katuns in a cycle, which was very nearly 400 years long. Cycle 9 of Maya chronology was the first historic period of the Maya civilization.

XUM

Photo from Sylvanus G. Morley

SCULPTURED STONE HEADS FOUND DURING THE EXCAVATION OF TEMPLE A

These heads, with the exception of the three in the bottom row, were found in front of the temple. Originally they had been fastened to the facade by rough stone tenons projecting from their backs. The large grotesque head in the second row was over the middle doorway, and the two heads in the third row were over the eastern and western doorways respectively. The three smaller heads in the bottom row were fastened to the back wall of the sanctuary, 5½ feet above the floor-level.

hood of 150 which are still indeterminate. These undeciphered hieroglyphics probably treat of the events which occurred on the corresponding dates; or, in other words, they probably deal with the subject-matter of Maya history.

The frame-work of Maya history—that is, its chronology—no longer presents serious difficulties to the student; but the more human side of this great aboriginal civilization, the records of its wars and conquests, its religious and social movements, its rise and fall, still remain a sealed book.

The building material used in Temple A is sandstone, which was quarried from the foot-hills two miles west of the city and probably transported thither on rafts during the rainy season, when the greater part of the valley is submerged by the overflow of the Motagua River.

In this way the building material could be floated right up to the base of the temple substructure. The blocks were finished—that is, either sculptured or faced—as occasion required, after they had been laid in the wall.

This accounts for the remarkable accuracy with which the lines of a design are carried from one block to another without a perceptible break in the composition. This is particularly true of the hieroglyphic cornice, which could have been sculptured only after the blocks were laid in the wall, so perfect is the fit of the lines in the details of the characters.

In addition to the temple just de-

scribed, one other building (Structure B) was excavated at Quirigua this year (see B, on p. 349). The relation of these two structures appears very clearly in the view of the temple court, shown in the photograph on page 353. This structure B can hardly be classified as a temple, but more readily falls into the dwelling or palace type of Maya structures.

It is built on the level of the temple court and does not rise from a substructure, like the other buildings surrounding this inclosure, which fact somewhat detracts from its dignity and impressiveness. Its ground plan is irregular.

There are no large open chambers rendered further conspicuous by unusual features of decoration, as in Temple A. Instead, the rooms are small and dark, the entrance, shown on page 358, being the only exterior doorway in the entire building.

All of the doorways are provided with pairs of stone hooks for hanging curtains. These are

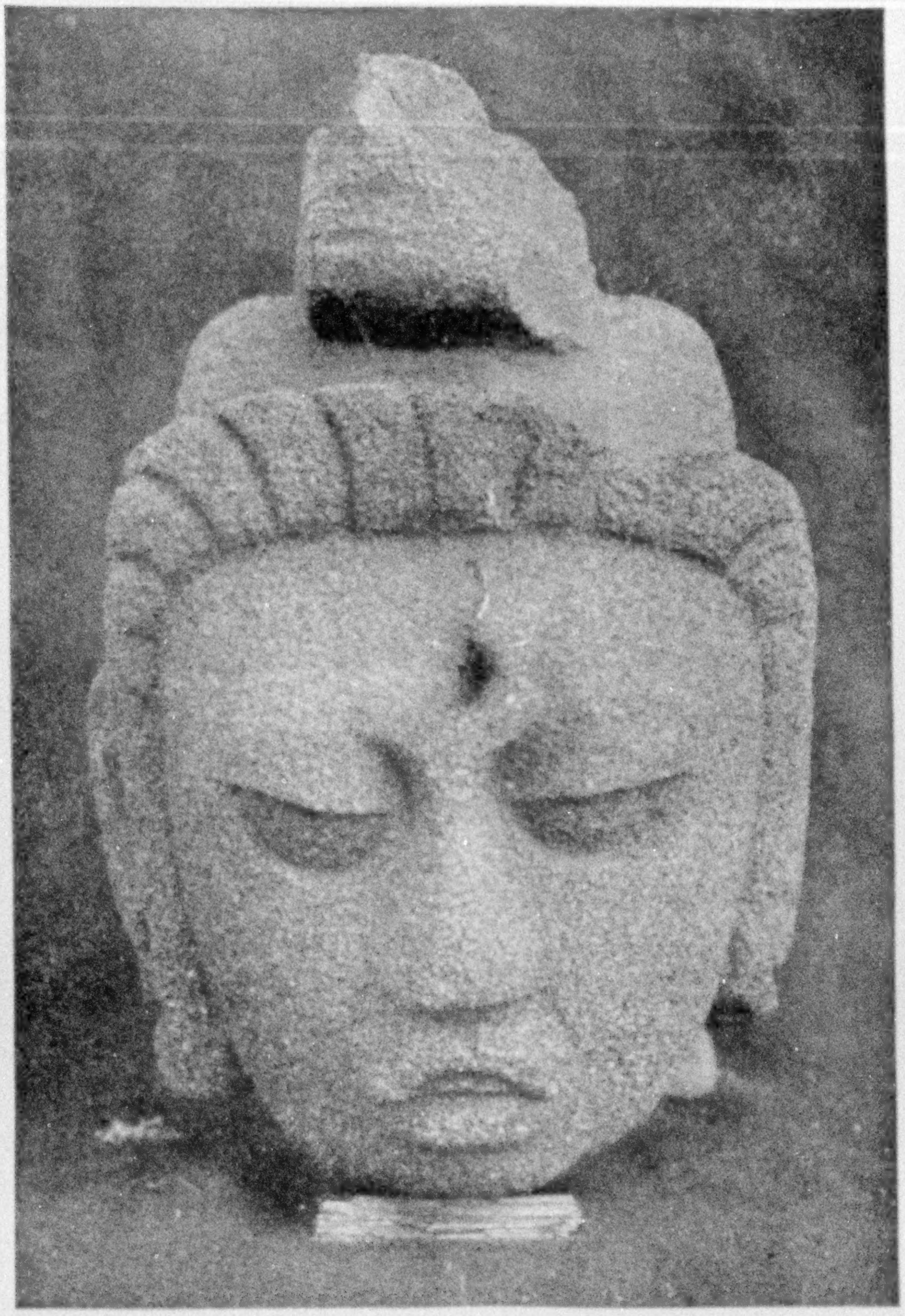
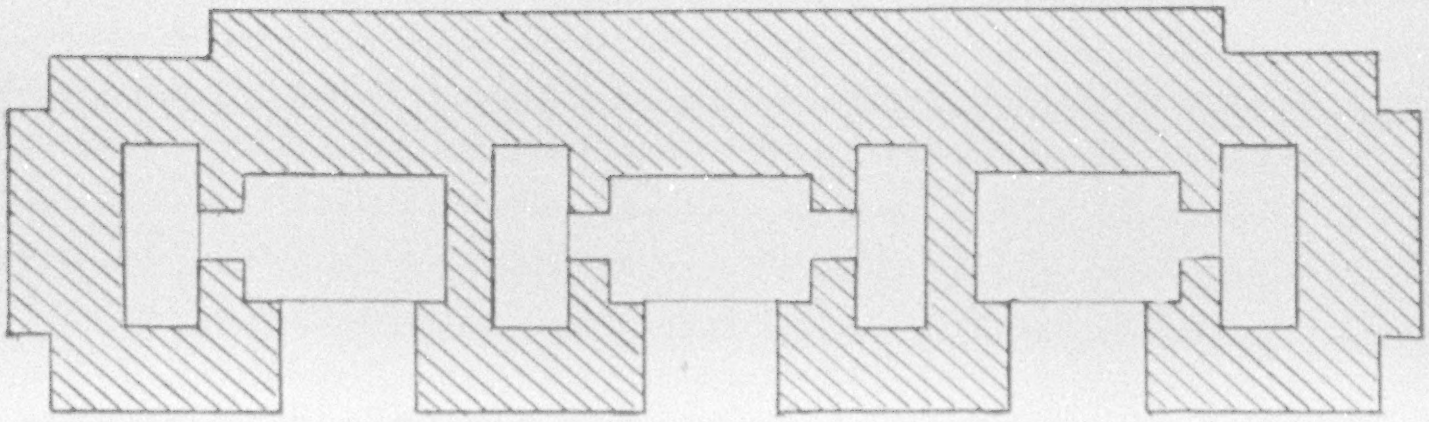


Photo from Sylvanus G. Morley

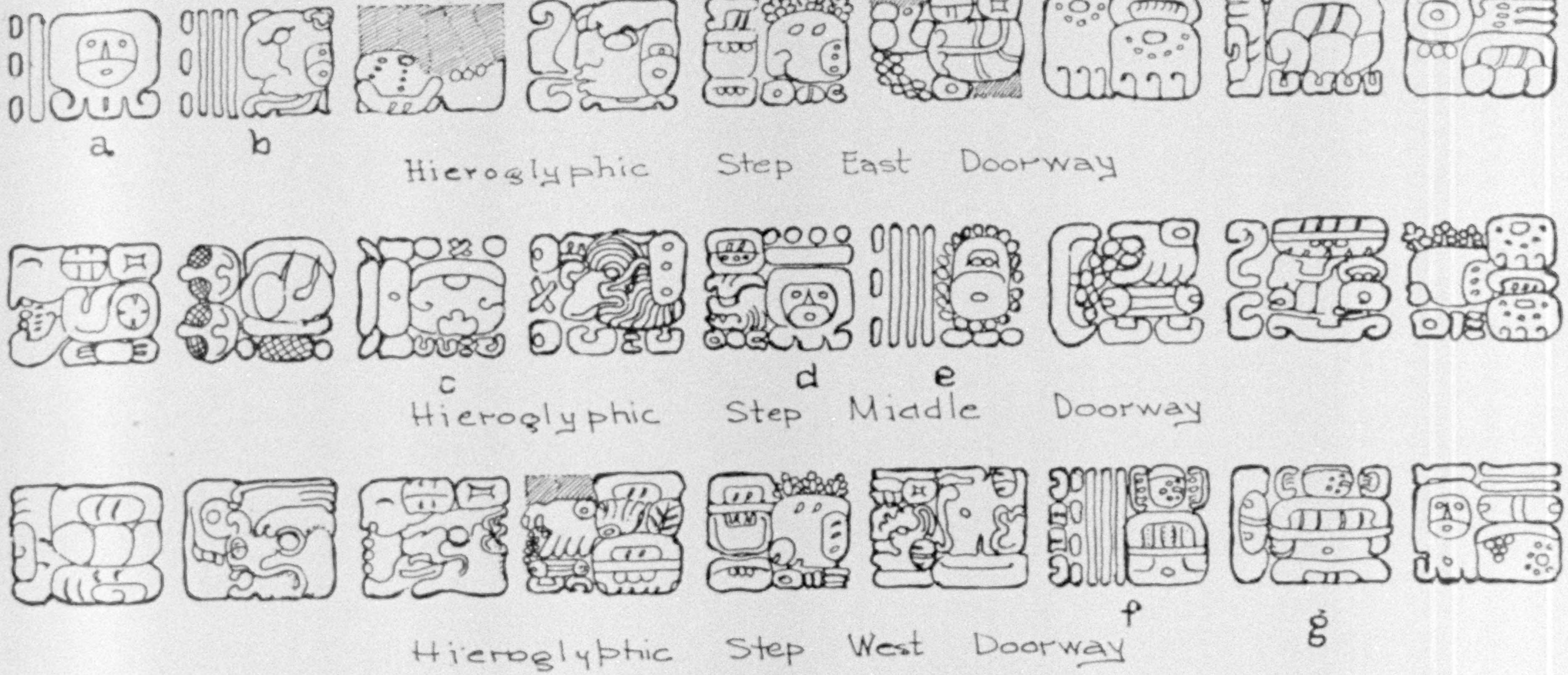
ONE OF THE STONE HEADS WHICH FORMERLY ORNAMENTED THE FACADE OF TEMPLE A



GROUND PLAN OF TEMPLE A

Note the proportion of wall space to room space in this building. The walls, which are of solid masonry, occupy nearly three times as much space as the rooms

XUM



HIEROGLYPHICS ON THE STEPS OF THE DOORWAYS LEADING INTO TEMPLE A

The hieroglyphics marked *d*, *e*, *f*, and *g* record the date 9 Ahau 18 Mol at the close of Katun 19 of cycle 9 of Maya chronology. This date corresponds approximately to the year 540 of the Christian era, and is repeated on the hieroglyphic cornice outside

Photo by George N. Bucklin, Jr.

NORTH FACADE OF TEMPLE A

This view shows the tremendous amount of repair work which necessarily accompanied the excavation of Temple A. When the walls were uncovered they were found to be in an extremely ruinous condition. Most of the building blocks had to be relaid in cement, and all of the walls had to be finished off with a waterproof cap to shed the large annual rainfall.

set in niches in the walls, two hooks on each side of a doorway—one at the floor level and the other 4 feet above. By means of these the door-hangings could be secured in four places and prevented from flapping in the wind.

The exterior of Structure B was decorated with the curious sculptural mosaic shown on page 359. This design occurs at each of the four corners and in the middle of the back and side walls. It is a variation of the grotesque head motive found throughout the Maya area.

A PREHISTORIC ROOSEVELT PORTRAIT

In this particular example the incisor teeth are as prominent as Colonel Roosevelt's, and the first tourists who saw the head immediately called it the original Roosevelt grin. Under this name its fame rapidly spread, until it became the chief point of tourist interest in the ancient city.

The yield of specimens from the smaller structure exceeded that from Temple A in both quality and quantity. Indeed, the finest specimen recovered during the entire course of the excavations—the effigy vase shown on p. 359—came from this apparently insignificant building. When discovered, this vase was broken into a score or more of small pieces, and it was not until after these had been put together that its true character was revealed. It is 7 inches in height and 3 inches in width at the top, flaring slightly at the bottom.

The body of the vase is a rich cream or buff in color, decoration being confined to the fluting already mentioned.

The grotesque head which ornaments its front is truly remarkable as an example of free-hand modeling, the features being rendered with a verisimilitude rarely encountered in any aboriginal art.

The eyes, ear-rings, fillet, and mouth are painted a dull bluish-white, the beard and fillet decorations being done in a rich

Photo by George N. Bucklin, Jr.

VIEW OF STRUCTURE B AFTER EXCAVATION

"In the deep twilight of a tropical jungle the crumbling remains of this once proud city lie forgotten, its builders unknown, and its very name lost in oblivion—a melancholy commentary on its vanished glory" (see text, page 360).

shade of red. When discovered, this vase was in fragments on the floor of a back room, in a dark and inconspicuous corner.

WHY WAS QUIRIGUA ABANDONED?

In finding such an unusual specimen one is prompted to ask, What dire circumstances could have necessitated its having been left behind? Was it abandoned in the extremity of sudden flight or overlooked in the confusion of an equally hurried sack? Or, again, could some general death or universal pestilence have laid low all the hands which might have borne it off?

The number of conjectures possible is as endless as such guessing is idle. Such questions by their very nature are destined to remain unanswered until the end of time.

In its dark corner, shattered and forgotten, this gem of Maya ceramic art slept undisturbed throughout the centuries, only to be awakened in another day and age by the archeologist's shovel.

Decidedly the most unique article recovered during the course of the work was a series of small worked hematites, found near the effigy vase above described. For the most part these were hexagonal in shape, about 1/16 of an inch in thickness and not over an inch in width between any two points. One side was very highly polished in each case, the other being ground smooth. The edges were beautifully cut, and in some cases finished off round, as though such pieces had formed the border of some mosaic. The use of these curious little stones is unknown.

THE AGE OF THE BUILDINGS

One important point which the excavation of Temple A and Structure B settled beyond dispute was the relative ages of the two buildings. After the southern side of the temple court had been par-

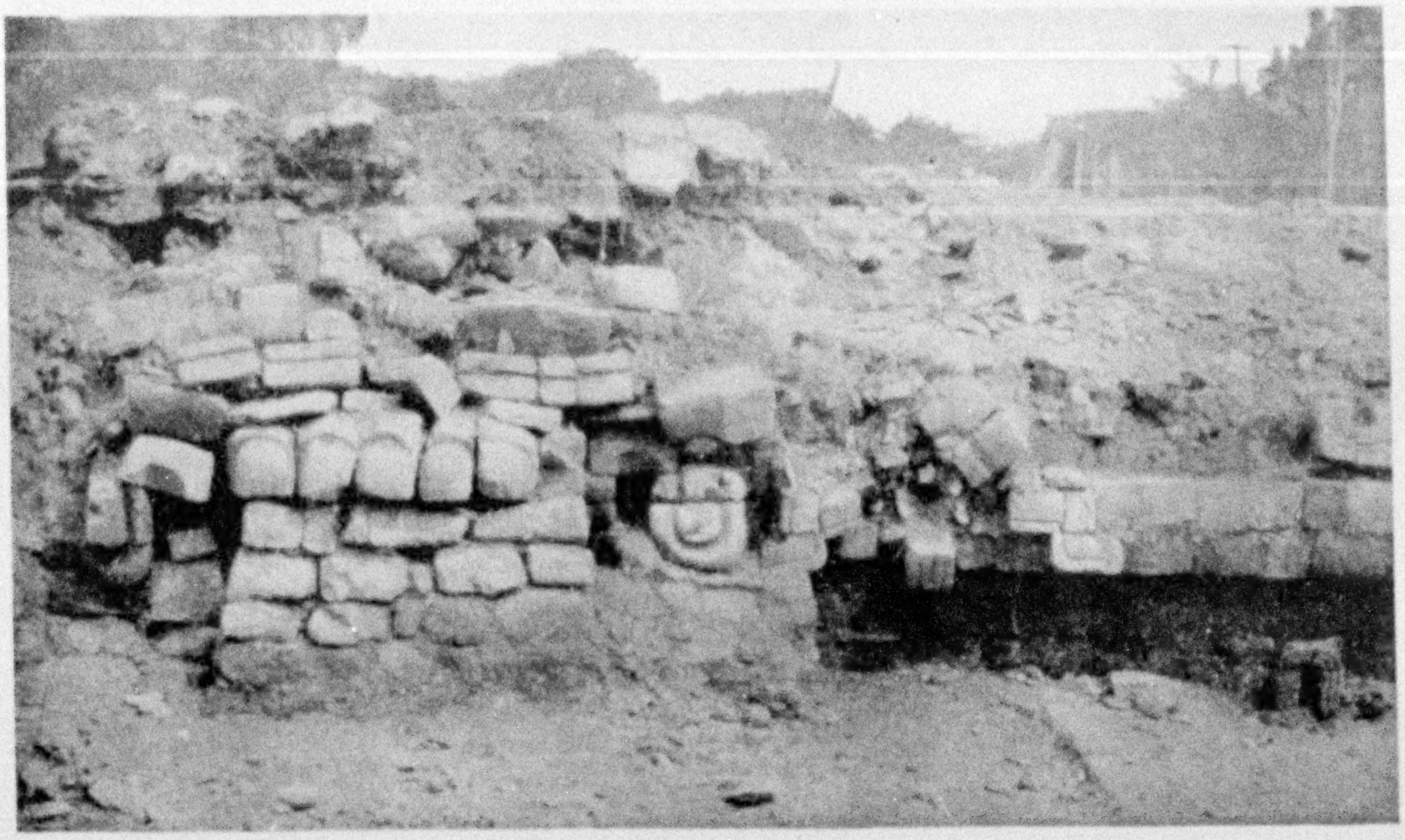


Photo from Sylvanus G. Morley

REMAINS OF A GROTESQUE HEAD ON THE SOUTH FACADE OF STRUCTURE B

The resemblance of the teeth to Colonel Roosevelt's incisors earned for this head the title "the original of the Roosevelt smile" (see page 357)

Photo from Sylvanus G. Morley

EFFIGY VASE FROM STRUCTURE B

This vase was found in a dark back room. It had been broken into about 22 or 23 pieces, all of which were recovered, with the exception of two very small fragments not exceeding a quarter of an inch in any dimension. It is unquestionably one of the finest examples of the Maya ceramic art that has ever been discovered (see page 357).

XUM

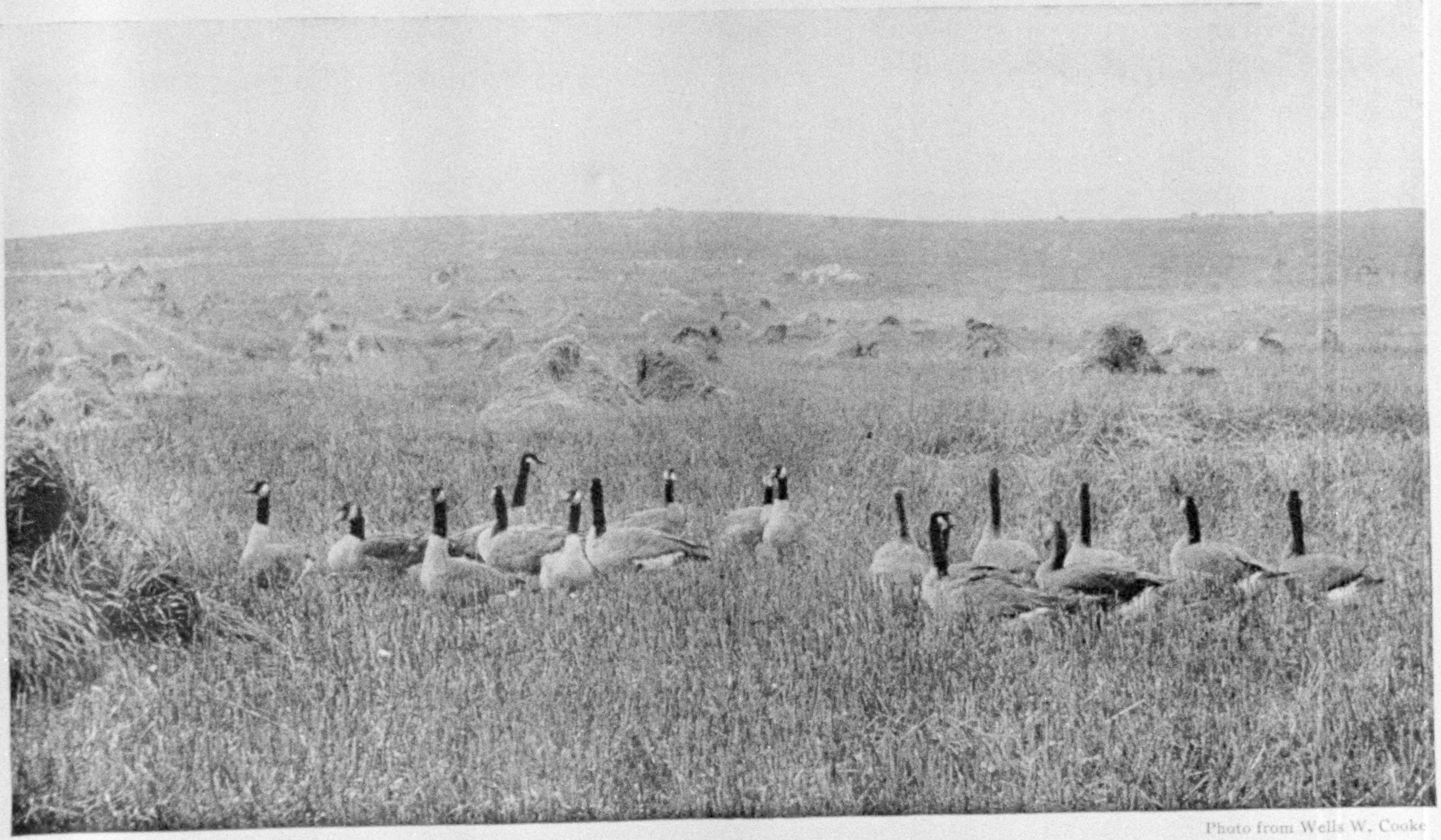


Photo from Wells W. Cooke

WILD CANADA GEESE IN A WHEAT FIELD NEAR THE UNITED STATES BIRD RESERVATION AT STUMP LAKE, NORTH DAKOTA

The bird reservations have been established with a view to affording the birds an undisturbed breeding ground. They vary in size from Hog Island, Wisconsin, which contains only two acres, to the Hawaiian Islands reservation, which extends over more than five degrees of longitude and includes the breeding grounds of more than a million sea birds. Those in North Dakota are in the center of the best duck-breeding grounds still left in the United States (see page 375).

tially excavated, it became apparent that the small building in the southwest corner—*i. e.*, Structure B—belonged to an earlier epoch than the imposing temple which towered above it. Indeed, Structure B is almost entirely surrounded by the platform of the larger building, which indicates that it was already standing when the foundations of Temple A were laid. This appears very clearly in the illustrations on pages 357 and 358, where Temple A is seen to be on top of the terrace built around Structure B. Except that it was erected at some time prior to Katun 19 (the date inscribed on Temple A), no definite conclusion as to the age of Structure B can be reached.

However, since the very earliest date at Quirigua only precedes Katun 19 by 87 years, it is probable that Structure B was built some time during the century preceding Katun 19, or during the period 440-540 A. D.

The excavation and repair of the two buildings above described constituted the work of the present year at Quirigua. When these ancient structures were finally uncovered, it was found necessary to make extensive repairs in order to preserve them from speedy deterioration and decay.

The building stones had to be relaid in concrete and the walls plumbed and finished off with a waterproof cap of cement to shed the enormous annual rainfall. These permanent improvements, however, necessarily consumed much time, and scarcely had been brought to a close before the rainy season set in, putting a stop to all work, excavation as well as repair.

THE REAL WORK YET TO BE DONE

So far as the possibilities of the site are concerned, the ground at Quirigua may be regarded as having been little more than scratched. The temple court alone has four other buildings surrounding it, to say nothing of the remaining courts and plazas of the city.

It is the purpose of the School of American Archeology to continue excavations here until an exhaustive study of the site has been made; for only through systematic investigations extending over a number of years can these great centers of the Maya civilization be made to tell their interesting story and contribute their quota to the record of man's progress and development.

Meanwhile, in the deep twilight of a tropical jungle the crumbling remains of this once proud city lie forgotten, its builders unknown, and its very name lost in oblivion—a melancholy commentary on its vanished glory.

SAVING THE DUCKS AND GEESE

By Wells W. Cooke

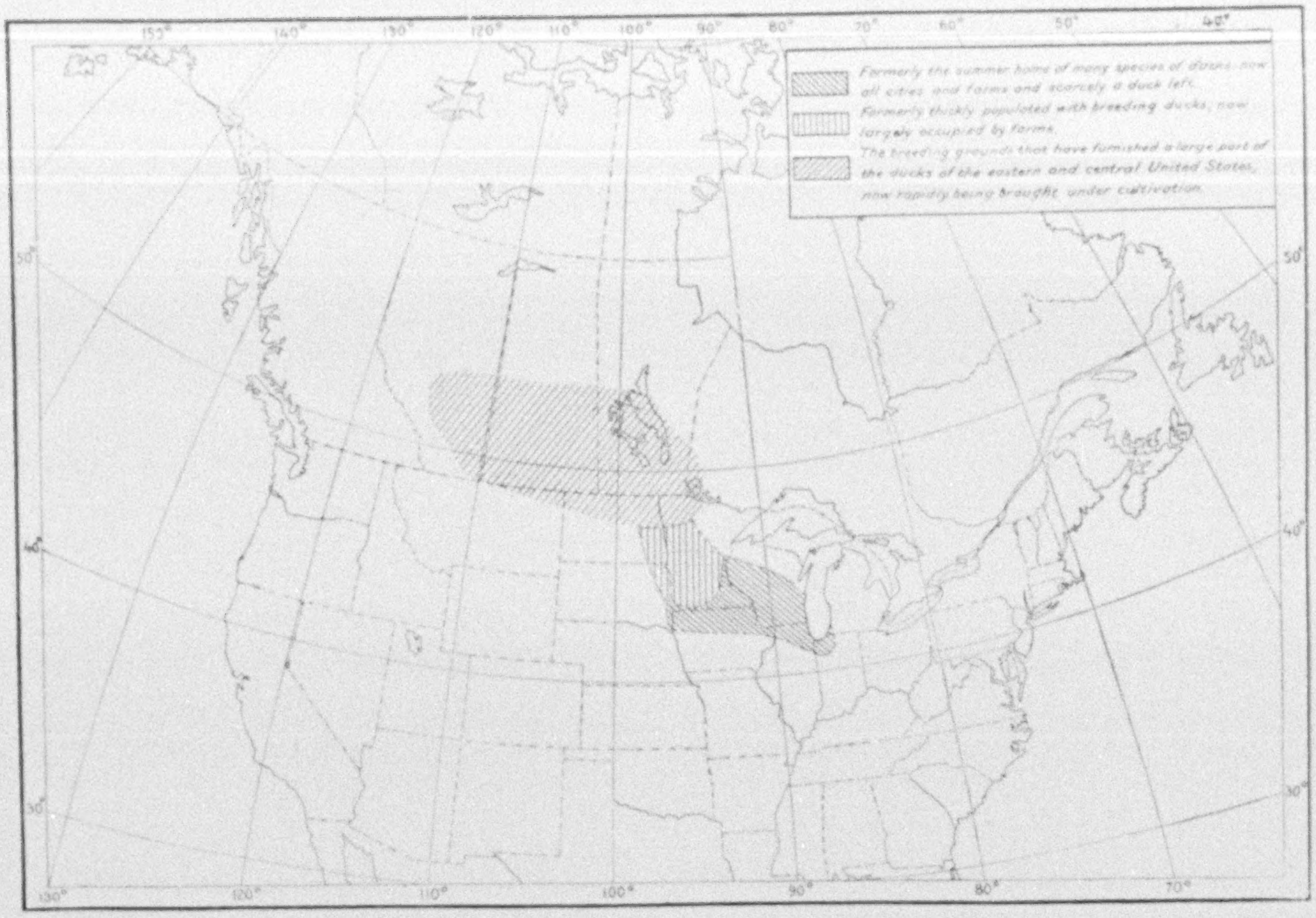
Biological Survey, U. S. Department of Agriculture

Author of "Birds that Fly from Pole to Pole," in the National Geographic Magazine

When the first settlers came to the United States they found the country teeming with waterfowl; the district along the Atlantic coast seemed to have an inexhaustible supply of ducks and geese. But in later years, when emigrants pushed westward and crossed the Mississippi, they discovered that the flocks of the coast were as nothing to the countless throngs that passed each spring and fall over the Western prairies.

The younger generation living today in Iowa and Wisconsin can have no idea of the abundance of ducks and geese found there 50 years ago, at which date their original numbers had been scarcely diminished.

Ducks and geese are by nature prairie, marsh, and swamp-breeding birds. A



MAP SHOWING THE BEST BREEDING GROUNDS OF WILD DUCKS AND GEESE

"All the lightest shaded area within the United States has now been brought so thoroughly under cultivation that it can never amount to much as a nursery for young ducks. The next heavier shading includes much of Minnesota and North Dakota, where there are still a great many lakes and marshes too large ever to be drained. . . . The most heavily shaded part in the northern United States and southern Canada represents what is left of the 'ducks' paradise'" (see text, page 363).

few species, such as the wood-duck, merganser, and golden-eye, nest in hollow trees; but those which are the most important from the standpoint either of food or sport—the Canada goose and the mallard, pintail, teal, redhead, and canvasback—breed in the open country.

DUCKS PREFER THE WEST FOR NESTING

The whole region east of Indiana and north of the Potomac River, including also all of Canada east of Lake Huron and Hudson Bay, has never had more than a few small tracts suitable for breeding grounds. Only one species—the black duck, or black mallard—nested there commonly, and that in numbers insignificant as compared with those of its nearest relative, the common mallard, in the Mississippi Valley.

In fact, the settlement of this eastern part of the country has decreased the acreage of duck-breeding grounds so little that if the black mallard was allowed proper protection, it would still nest in goodly numbers throughout this entire area.

No other duck seems to have cared to nest in any numbers east of Hudson Bay, and the enormous flocks of ducks reported by the early settlers, in the fall migration, were not eastern-bred birds, but were travelers from the interior of the North American continent, where tracts of country furnishing exactly the conditions desired by ducks and geese were to be measured by square miles instead of acres.

The so-called "prairie region" of the United States then extended into Illinois and northwestern Indiana, and so much of it as was occupied by lakes and marshes—northern Indiana, a wide strip of northern Illinois, another strip of northern Iowa, and thence northward to the Arctic Ocean—was crowded with

breeding ducks and geese. The map (see page 362) shows the approximate outlines of this area.

It is noticeable at once that much of the lower half of this vast region, formerly held in undisturbed possession by wildfowl, is now an almost continuous farm and garden, and the millions of waterfowl have been replaced by several millions of human beings.

WHERE THE DUCKS' PARADISE IS FOUND

The prairie districts of central Canada, comprising large portions of Manitoba, Saskatchewan, Alberta, and Mackenzie, have been and still are the "ducks' paradise." Almost equally attractive to them are the northern part of North Dakota and much of northwestern Minnesota, the whole forming a tract 200 miles wide and 400 miles long, abounding in lakes, ponds, sloughs, and marshes, which furnish ideal nesting conditions and a plentiful supply of food; and 50 years ago every available nook was preëmpted by waterfowl.

But the "paradise," too, has been disturbed. The Northern Pacific and other railroads cut across its southern border in Minnesota and North Dakota, a north and south line was run to Winnipeg, and other shorter branches were built.

A still more severe blow was dealt the waterfowl when the Canadian Pacific Railroad crossed, between Winnipeg and the Rocky Mountains, the finest duck-breeding grounds on the continent. During the decade just ended their last stronghold has been invaded by the new Grand Trunk Pacific Railroad, and soon the great colonies of northern Alberta and northern Saskatchewan will be things of the past.

It is evident, therefore, that in a few years neither the United States nor southern Canada will have any large breeding places of those species of ducks which are most highly valued for sport and for the table.

The map on page 362 shows the existing status of the breeding grounds which have been enumerated. All the lightest shaded area within the United States has now been brought so thoroughly under cultivation that it can never amount to much as a nursery for young ducks.

The next heavier shading includes much of Minnesota and North Dakota, where there are still a great many lakes and marshes too large ever to be drained. Though the number of ducks throughout this area has been greatly diminished, yet in the aggregate a good many broods are reared each year.

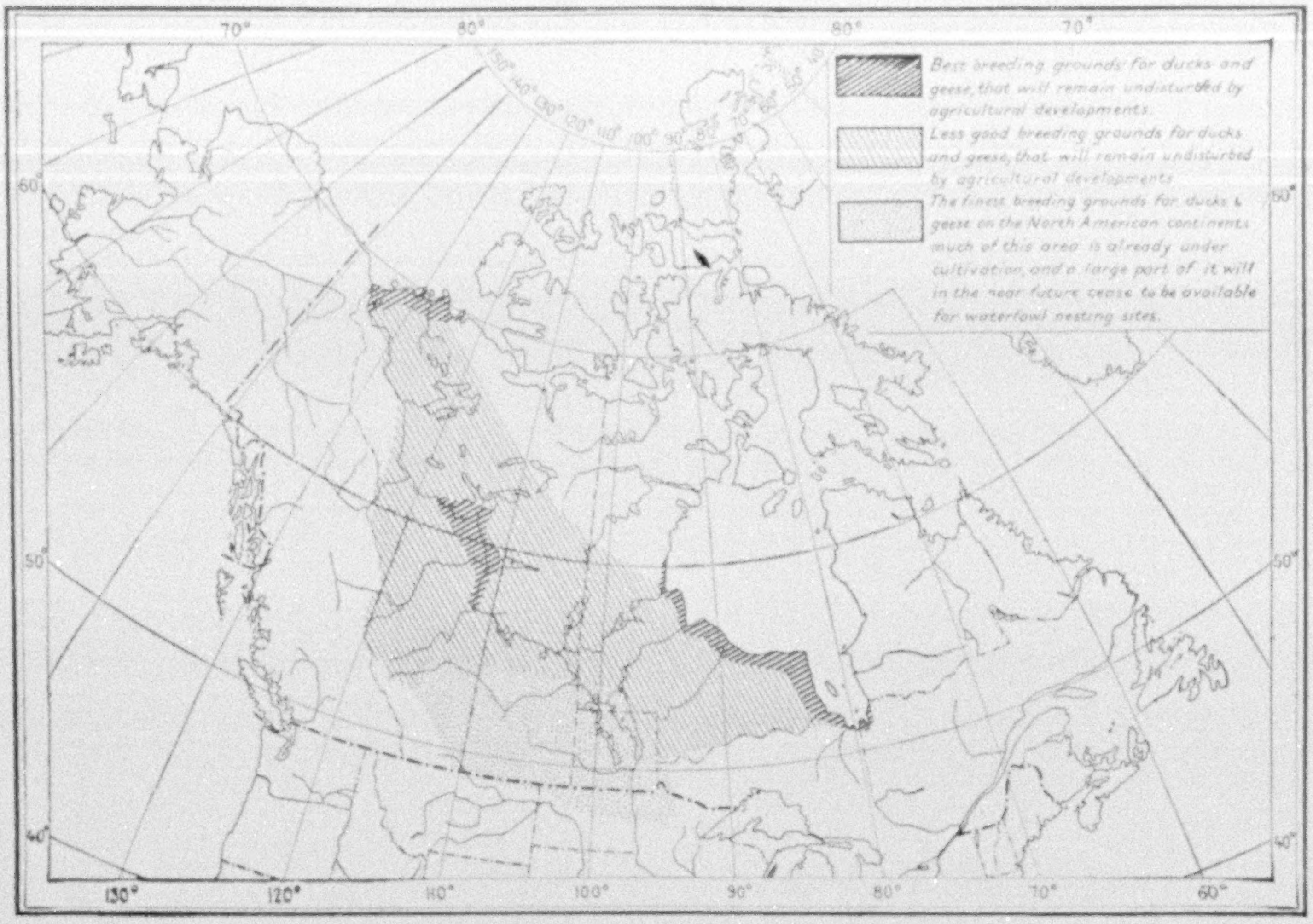
The most heavily shaded part in the northern United States and southern Canada represents what is left of the "ducks' paradise," and nesting ducks are still present in large numbers over the whole area.

THE FUTURE IS BY NO MEANS HOPELESS

Owing to two facts, the future of the ducks and geese of North America is not so gloomy as some are inclined to think. First, there is a rapidly awakening interest in the preservation of game of all kinds, and, second, there is an overlooked area in North America of considerable size, which is well adapted for the breeding grounds of ducks and geese, and is so far north and has so severe a climate that it never will be used to any great extent for farming. Indeed, the places best adapted to the waterfowl—the great marshes—are too wet and cold even in mid-summer ever to be available for agriculture.

The largest and best of these districts lies in the neighborhood of Athabaska and Great Slave lakes. It includes the whole of the Slave River, the lower hundred miles of the Athabaska River, and the region to the westward for distances varying from 50 to 250 miles.

Here are some 30,000 square miles that with even moderately good protection during the breeding season will produce annually a liberal crop of the most valued kind of ducks. To the northward lies another district, including the delta of the Mackenzie and the Arctic coast east to Franklin Bay, that supports each year a large waterfowl population, including the mallard, green-winged teal, and several species of geese, but is too far north for the gadwall, blue-winged teal, redhead, and canvasback (see map, p. 364).



MAP SHOWING THE ALMOST UNDISTURBED BREEDING GROUNDS OF THE DUCKS AND GEESE IN NORTHERN CANADA

Which will prevent the extermination of these waterfowl if they receive adequate protection in the United States (see text, page 363)

Eastward a third area fringes Hudson and James bays on the west and extends from the south end of James Bay to 100 miles beyond Cape Churchill.

Many ducks have nested from time immemorial throughout this region and have been practically undisturbed by man, and it seems probable that this condition will continue for years to come.

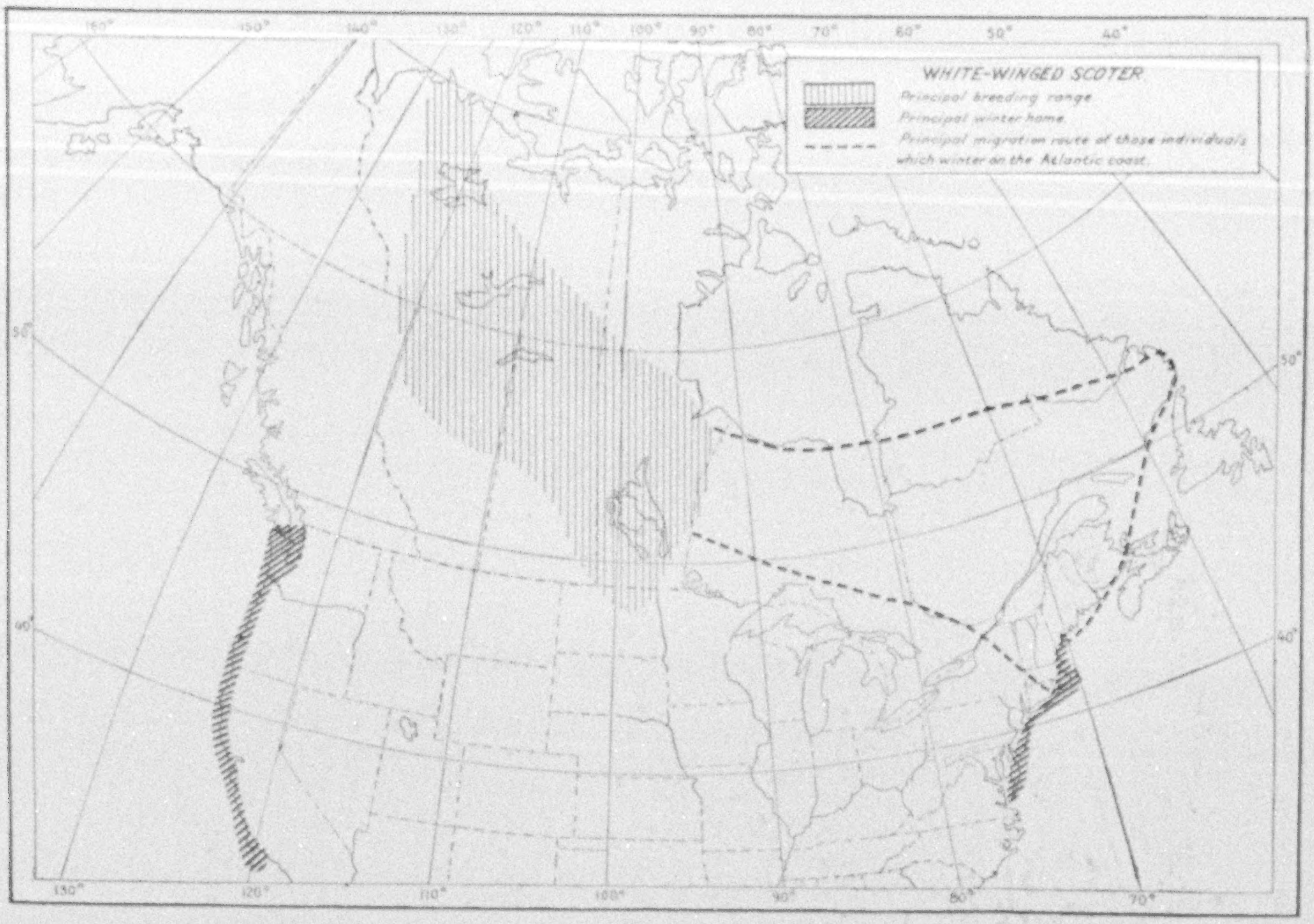
These three districts are the best, but throughout the whole immense intervening area—lightly shaded on the map shown above—are innumerable small lakes and marshes, each well adapted to support a few pairs of ducks and geese. Moreover, by suitable legislation, southern Saskatchewan, nearly the whole of Manitoba, and the contiguous parts of the United States can be made to produce perennially their present large crop of aquatic game birds.

WHY PROTECTION PAYS

Some birds are protected because of their diet, as the wood-peckers and fly-catchers; others for their song—thrushes and mocking-birds; others for esthetic reasons—gulls and terns; while the protection of ducks and geese is purely utilitarian; they furnish a highly prized food, and the sport of hunting them involves an outdoor life and exercise which is worth far more to the individual and the community than the dietary value of the game secured.

Twelve years ago the national government recognized the need of preserving the ducks and geese as part of the national resources and they were included in the "Lacey Act"—the national law for the preservation of game. The enforcement of this law was put in the immediate charge of the Bureau of Biological Survey, and the facts contained in this article were gathered mainly in the course of investigations connected with the carrying out of the provisions of that act.

Under that law wild ducks and geese are the property not of the individual on whose land they happen to nest or alight,



MAP SHOWING BREEDING GROUND, WINTER HOME, AND CURIOUS MIGRATION ROUTES OF THE WHITE-WINGED SCOTER

"Its breeding grounds cover an immense area in Canada. . . . In the fall some of these scoters go west and southwest to winter along the whole Pacific coast of the United States. . . . But most scoters in the fall take an easterly flight, and they are particularly abundant in winter on the Atlantic coast from Cape Cod to southern New Jersey, especially in the neighborhood of Long Island Sound" (see text, page 367).

but of the whole people, as represented by the State, and the modern doctrine of the conservation of natural resources requires that the laws be so framed that the State—*i. e.*, the people—shall receive the largest practicable return for each bird.

Experience of the last few years has shown conclusively that a duck killed for the home consumption of the gunner, or, as it is ordinarily called, "killed for sport," yields a manifold larger return to the State and to the community than one killed by a market gunner as a means of obtaining a livelihood; or, to put it in the baldest way, a market gunner adds nothing to the wealth of the community and obtains his living by an unnecessarily high drain on the State's assets.

WHAT IS THE MOST URGENT NEED?

Hence the most urgent need at this time is to forbid by law, at least for a time, all purchase or sale of domestic game birds. With this as the universal law in Canada and all of the United States—as it is already in 19 of the States—the business of the market gunner is gone; he need no longer be taken into account, and it seems probable that this single restriction will be sufficient to stop to a great extent, if not entirely, the present falling off in our waterfowl census.

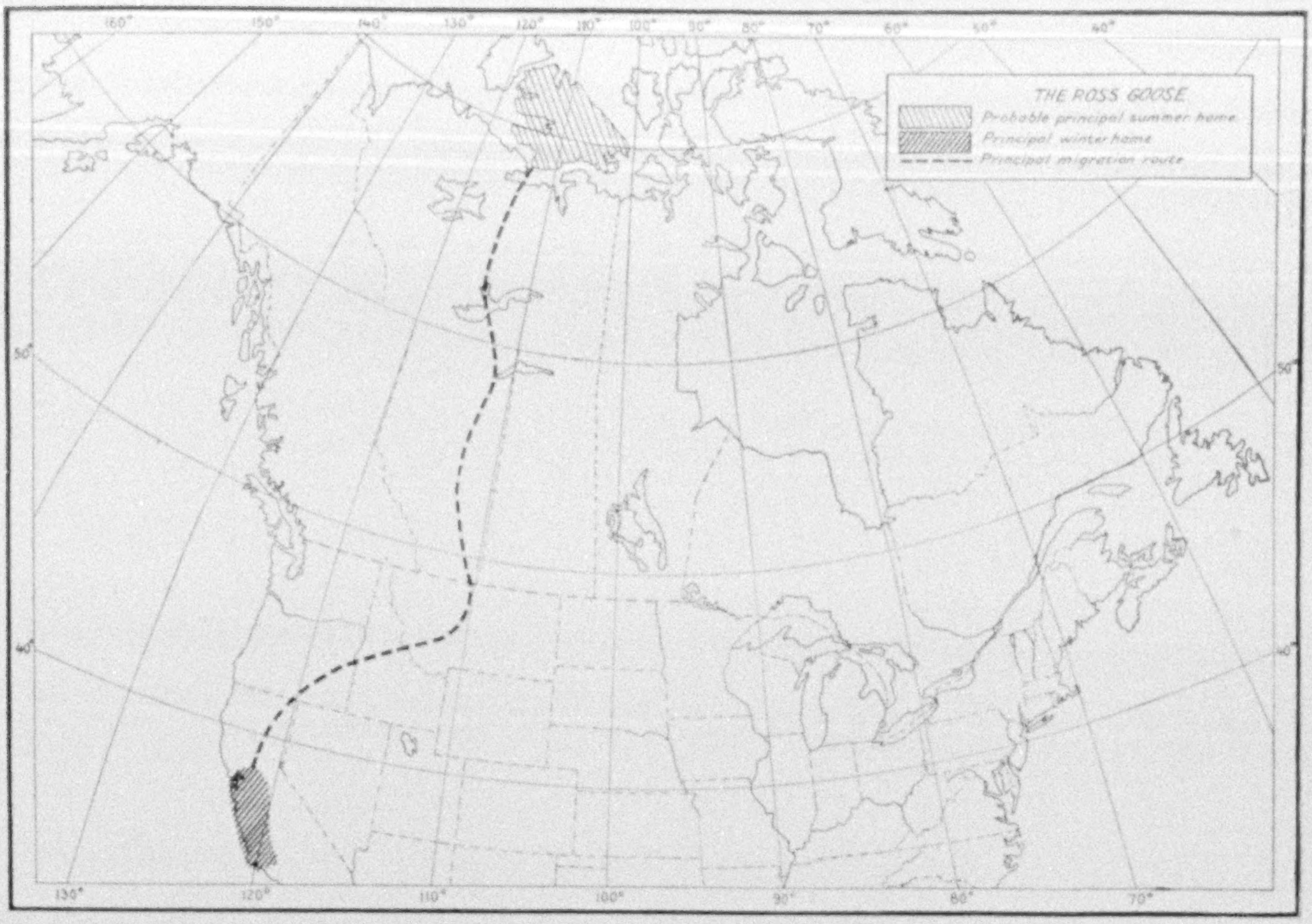
To impress this idea on the general community is the most important single item in the struggle for game protection. It gives a solid cash basis to the appeal for restrictive laws, and when once the public come to see this matter in its true light, the fight for game protection is won.

Some birds protect themselves. For instance, the abundant and well-known white-winged scoter—or white-winged "coot," as it is more commonly known

Photo from Wells W. Cooke

MALLARDS FEEDING ON THE PRESERVE OF E. A. MC ILHENNY: AVERY ISLAND, LOUISIANA

"Here congregate thousands and tens of thousands of mallards, accompanied by teal, widgeon, shovelers, and redheads, with a large number of geese of several species. The best feeding is in a comparatively narrow strip along the coast, and this region fairly swarms with waterfowl" (see text, page 375).



THE BREEDING GROUND AND WINTER HOME OF THE ROSS GOOSE

"From its breeding grounds on the high Arctic Islands it comes south through the Mackenzie Valley; but instead of turning to the southeast, to winter on the Gulf coast with the other geese and ducks which have been its traveling companions, it parts company with them at the national boundary line, goes south into Montana, and then strikes westward, crossing the lofty ranges of the main chain of the Rocky Mountains and winters in California" (see text, page 368).

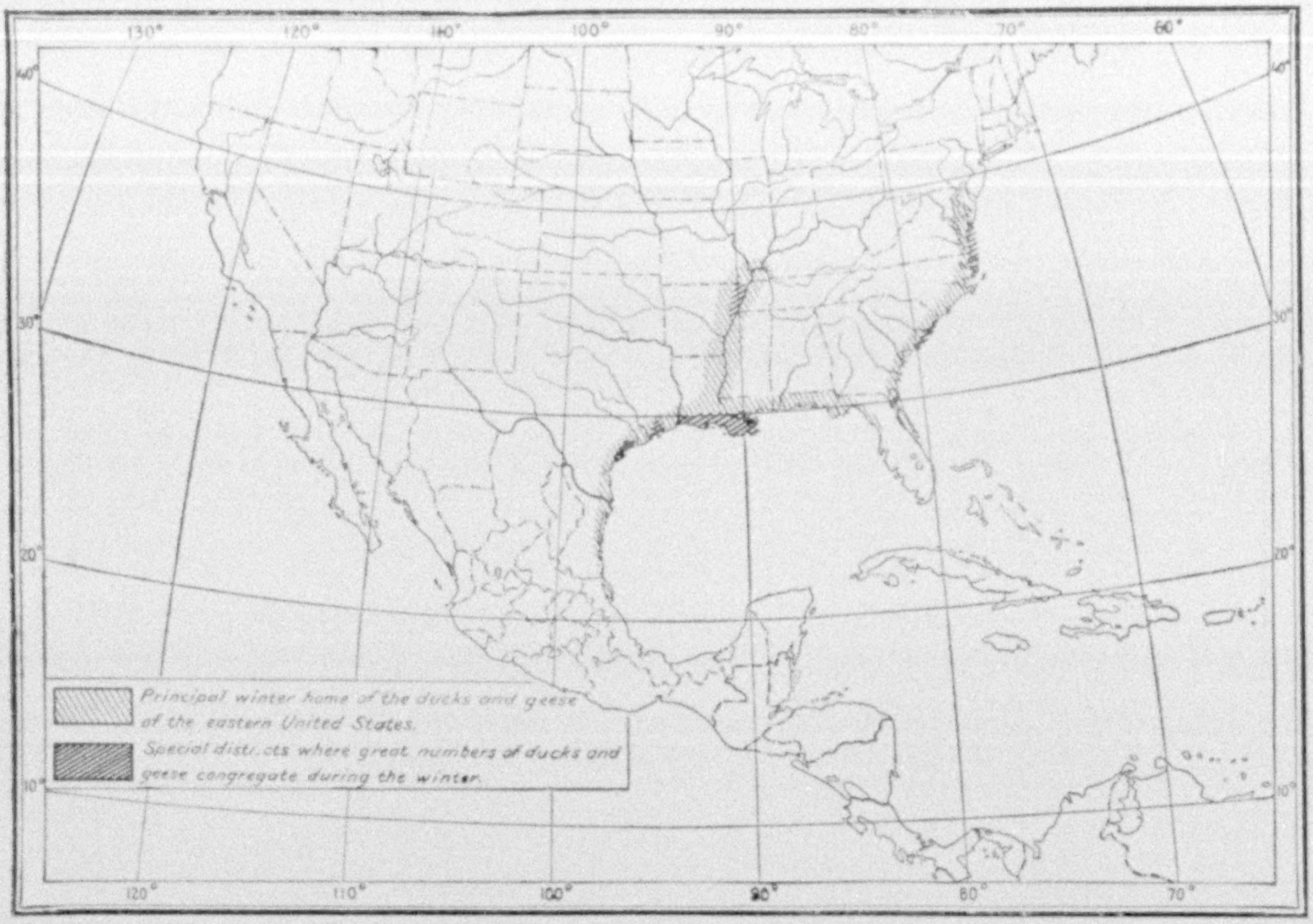
on the New England coast—is probably as common now as it was 50 years ago, in spite of scant protection by law. The reason for its escape from the woeful fate of its relatives is found in the regions chosen for summer and winter sojourn and in its unique migration route or, rather, routes.

Its breeding grounds (see map, page 365) cover an immense area in Canada and are mainly in a district which is still sparsely inhabited and is likely to remain so; at least, it will hardly have population enough to interfere with the nesting of the birds. In the fall some of these scoters go west and southwest to winter along the whole Pacific coast of the United States. Here they have not as yet been much molested, owing to the small market demand and the difficulty of getting within shot range, as they both feed and sleep on the ocean.

But most scoters in the fall take an easterly flight, and they are particularly abundant in winter on the Atlantic coast from Cape Cod to southern New Jersey, especially in the neighborhood of the eastern end of Long Island Sound. Here 100,000 and more have been seen in a single day; but as they, too, remain continually on the ocean, they are less easily killed than are birds which feed closer to land.

CURIOUS MIGRATION ROUTES

Another peculiarity is the migration routes of these Atlantic Ocean wintering birds. Although few, if any, nest in the Labrador Peninsula, yet in August they become abundant as migrants along the east coast of southern Labrador, showing that they must have come 1,500 miles almost due east from their nearest breeding grounds in Canada. In the late fall



MAP SHOWING THE PRINCIPAL WINTER RESORTS OF THE WILD DUCKS AND GEESE

they repair to the Gulf of St. Lawrence and gradually work south on the advent of winter to the southern New England coast.

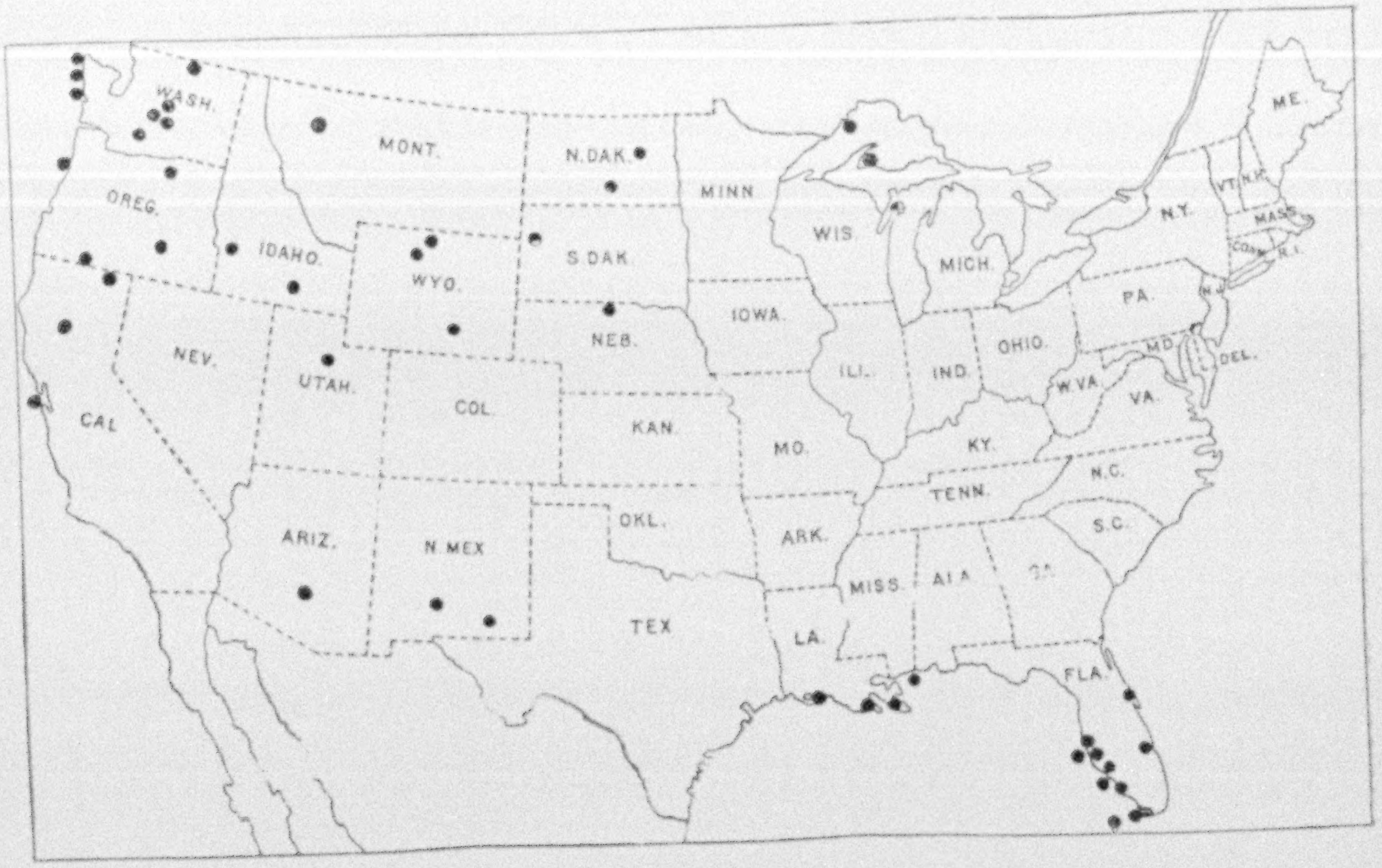
The following spring, instead of retracing the round-about fall migration route, the main flight of coots takes a short cut west in Long Island Sound to the mouth of the Connecticut; up the valleys of the Connecticut and Hudson rivers to the valley of the Ottawa, and thence west and northwest to the breeding grounds. Thus during their fall migration they are passing through a country almost entirely uninhabited, while their spring flight over the thickly populated parts of Connecticut and New York is made for the most part by night. Under these circumstances it is not surprising that the scoter succeeds in holding its own.

Another species that has an equally peculiar migration route is the Ross snow goose. It is one of the very rare geese in North America and is also the smallest, about the size of a mallard duck. From its unknown breeding grounds on the high Arctic Islands it comes south through the Mackenzie Valley; but instead of turning to the southeast to winter on the Gulf coast with the other geese and ducks which have been its traveling companions, it parts company with them at the national boundary line, goes south into Montana, and then strikes westward, crossing the lofty ranges of the main chain of the Rocky Mountains and winters in California (see map, page 367).

WHEN SHOULD THESE BIRDS BE PROTECTED?

The problem of waterfowl protection has four distinct phases corresponding to the four seasons of the year. The summer or the breeding season is acknowledged to be the time when the shooting of ducks and geese is most pernicious. Practically all our States and Canada are agreed that hunting should cease absolutely during the weeks when the birds are nesting.

Only a little less disastrous is hunting during spring migration, when the lucky survivors of the winter's campaign are on their way to the nesting grounds. Just now the struggle for game preservation



MAP SHOWING THE LOCATION OF 46 OUT OF THE 56 NATIONAL BIRD RESERVATIONS

The other 10 are located in Alaska, Hawaii, and Porto Rico (see text, page 375)

in the United States is centering around the proposition to abolish all spring shooting. This has already been done by several of the States which are most enlightened in their treatment of wildfowl preservation; but enormous numbers are still shot in Iowa and especially in the bottoms along the Illinois River.

It is confidently expected that in the near future the good sense of the general community will recognize how shortsighted and wasteful it is to lose a large fall supply of well-fattened fowls for the privilege of obtaining earlier in the year a much smaller quantity in poor condition.

Some advocates of spring shooting claim that hunting can safely be allowed until the ducks begin to pair; but the pairing season with some species is very early in the year; the wood-duck begins nesting in early February, and some of the other species are paired by the middle of the month. Any attempt to make separate laws and dates for the different species would prove unsatisfactory, and the only practicable way is to prohibit all spring shooting.

WHY A SHORT HUNTING SEASON IS MOST PROFITABLE

Admitting that both spring and summer shooting are utterly indefensible, the question is at what time may hunting properly and profitably be allowed. The matter of game protection should be handled from a rational business standpoint, like the handling of any agricultural product. There is some one time in the growth of a crop when its yield will be of the highest market value, and the wise agriculturist waits for that time and then harvests in a few days the output of the whole year. Moreover, he is careful to save enough for seed, so that the crop of the following year may be at least no less bounteous.

Every one will admit that the greatest number of waterfowl of the highest value individually can be obtained yearly if all the shooting is done—*i. e.*, the year's crop is harvested—in the fall, after the young are fully grown and while the birds are on their fall migration trip. If birds are absolutely undisturbed by human agencies from the time they reach their winter home until they have completed the molt

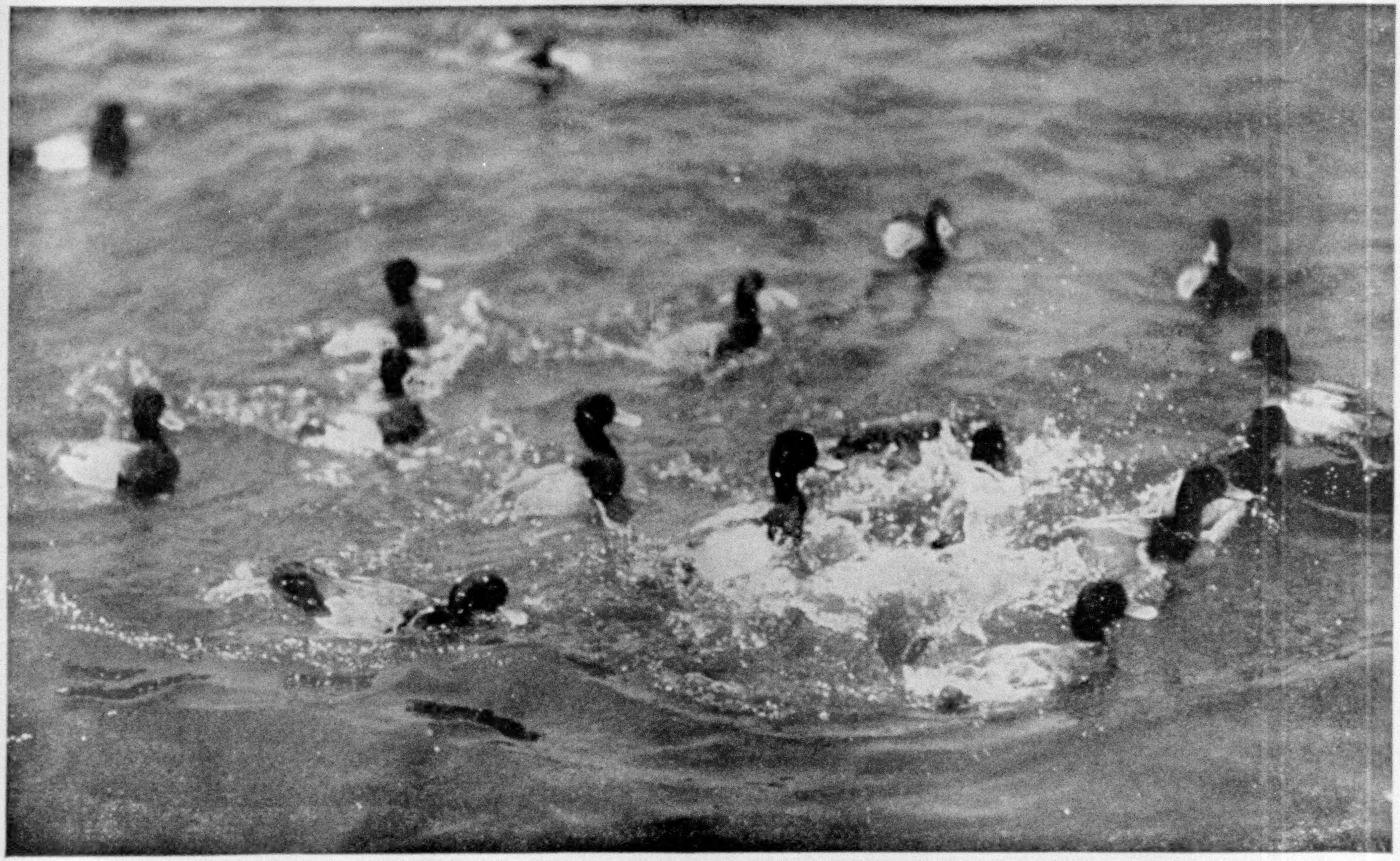


Photo by Herbert K. Job

WILD LESSER SCAUPS BEING FED BY HAND AT PALM BEACH, FLORIDA

"At Palm Beach, Florida, where no hunting is allowed within a mile of the town, ducks have become so tame that they will come for food within a few feet of a person, while outside the mile limit these same birds are so wild that it is difficult to get within gunshot range of them" (see text, page 377).

the following fall, they will rear the largest proportion of the largest-sized families and furnish the greatest amount of food and sport.

WINTER SHOOTING IS DISASTROUS

To understand the importance of prohibiting the winter hunting of waterfowl in the United States it is necessary to know something about the districts in which the birds are found at this season and the conditions surrounding them there. Ducks must have open water, and hence winter in the Southern States. They retire southward slowly in the fall, as they are driven away from their feeding places by the advancing ice. Many do not reach their real winter haunts before December and some not until the end of that month. Though the outside boundaries of this winter home include a large area, the birds concentrate themselves on that very small fraction of the area which offers good physical conditions and plenty to eat.

For instance, Arkansas contains 53,000 square miles, but Mississippi County, with less than 900 square miles, is more important as a duck winter resort than all the rest of the State. In other words, during the winter the majority of the ducks of Arkansas are collected on less than 1/60th of the State's area. Obviously, under such conditions, the bagging of a great many at one time and place is a comparatively easy matter; hence the market hunter seeks out these favorite feeding spots and shoots there all winter.

Accomac, Northampton, and Princess Anne counties, in Virginia, with an area of less than 1,000 square miles, send to market more ducks than all the other 32,000 square miles of the State put together. In fact, if the shipment or sale of ducks was prohibited in these three counties, it would have more effect in checking the present deplorable decrease of ducks there than would absolute prohibition of hunting in all the rest of the State.

Evidently, then, if the ducks can be protected during the winter in such favored localities, the progressive reduction of the duck population would change speedily to a progressive increase.

The map (see page 368) shows the general area of the principal winter homes of the ducks and also the special feeding places where they congregate.

WHY THE CANVASBACK LEFT CHESAPEAKE BAY

Among the latter, Chesapeake Bay is not marked, although 60 years ago it was one of the most important wintering places for ducks in the United States, usually spoken of as a winter resort, though really there was a time during most winters when the ducks were forced by the ice farther south for a few days or weeks.

Persistent persecution by gunners from early fall to late spring has almost annihilated the myriads of fowls of the finest varieties that used to blacken the surface of the bay. Here was the preferred winter home of the celebrated canvasback, whence many hundred thousand dollars' worth of the birds have been shipped to the northern markets. Today a canvasback is almost a rarity in Chesapeake Bay, and the few survivors spend the winter farther south, on the North Carolina coast.

Chesapeake Bay was formerly the natural goal of a large proportion of the canvasbacks and redheads which nested in central Canada. They had a peculiar migration route. Nesting in the lake region of Manitoba and Saskatchewan, they found stretching thence southeastward an almost continuous chain of lakes supplying an abundance of food and especially favorable conditions to tempt a journey in that direction. This flight led, naturally, to Chesapeake Bay, which used to provide an almost unlimited quantity of their greatest delicacy—wild celery—and otherwise was admirably adapted for a fall, winter, and spring sojourn, except during an occasional week or two of unusually cold weather.

This southeast and northwest route is still used by most of the thousands of ducks that winter on the entire Atlantic coast from Virginia southward, and the now almost deserted waters of the upper Chesapeake would be repopulated to a large extent if wise restrictive legislation were in force.

The south shore of Long Island, N. Y.,

Photo from Wells W. Cooke

WILD BLUE GEESE ON THE PRESERVE OF E. A. MC ILHENNY: AVERY ISLAND, LOUISIANA

This is one of the rare species which the new Ward-McIlhenny Game Refuge will help to preserve from extermination. "Here is the principal winter home of the blue goose, one of the rarest and most interesting of North American geese. Going northward in the spring, their pathway can be traced until they reach Hudson Bay. There they disappear; the nest and eggs have never been found, and no white man has ever reported seeing a blue goose in the summer" (see text, page 377).

THE WARD-MC ILHENNY AND THE LOUISIANA REFUGES FOR GAME BIRDS

"Two gentlemen—C. W. Ward and E. A. McIlhenny—purchased some 50,000 acres and hired game wardens at their own expense to patrol the district and prevent all shooting. Later they deeded 13,000 acres to the State of Louisiana to serve as a perpetual bird refuge" (see text, page 377).

Currituck Sound, N. C., and the neighborhood of Georgetown, S. C., are now the most important ducking grounds on the Atlantic coast. Gunning clubs have obtained possession of most of the best hunting places on these coasts, but the market gunner is still quite notably in evidence.

Many ducks winter on the Texas coast near Galveston and some even venture south to the Mexican coast, at Tampico. Fortunately in these localities the market hunter has ceased to be an important factor of the question, for Texas has prohibited absolutely all shipment of waterfowl out of the State for sale.

The northeastern corner of Arkansas, around Big Lake, is one of the special danger spots from the ducks' standpoint. A constant succession of flocks occupy the region during a protracted fall migration and most of the time throughout the winter. The conditions are favorable for their easy slaughter, and almost un-

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Photo from Wells W. Cooke

BLUE-WINGED TEAL ON THE PRESERVE OF E. A. MC ILHENNY: AVERY ISLAND, LOUISIANA

"The whole coast from the mouth of the Mississippi to the Texas border abounds with lakes and marshes and offers most alluring winter attractions for ducks" (see text, page 375)

believable stories are told of the thousands of mallards sent to market by single gunners.

WHERE THE GREATEST SLAUGHTER TAKES PLACE

There remains for consideration the coast of Louisiana, which at present is the leading factor working for the extermination of those species that have a high market value. The whole coast from the mouth of the Mississippi to the Texas border abounds with lakes and marshes and offers most alluring winter attractions for ducks.

Here congregate thousands and tens of thousands of mallards, accompanied by teal, widgeon, shovelers, and redheads, with a large number of geese of several species. The best feeding is in a comparatively narrow strip along the coast, and this region fairly swarms with waterfowl.

Here are collected on a few hundred square miles the ducks that during the breeding season have been scattered over many hundred thousands of square miles. They begin to arrive early in the fall, remain until late in the spring, and throughout this whole long season they are the easy prey of the market hunter, for the State game law allows duck shooting during the entire winter.

It is extremely difficult to make the inhabitants of southern Louisiana grasp the idea that such conditions are exceptional, or that there is any possibility that their winter sport can endanger the game supply of a continent. Yet a careful census in 1910-1911 of the ducks killed in Louisiana during that one winter totaled so many hundreds of thousands as to be almost unbelievable.

Is it any wonder that spring after spring the hunters in the upper Mississippi Valley report the migrating flocks as becoming smaller and smaller?

So loth are ducks and geese to relinquish their choice feeding places that they return there day after day in spite of incessant shooting, and it is estimated by good authority that at every shooting ground frequented by market hunters, both on the North Carolina coast and in southern Louisiana, at least 50 per cent of all the ducks that winter there are killed before the remnant depart in the spring.

No class of birds can stand such slaughter, especially when there is added to this 50 per cent all those shot during the spring and fall migrations.

BIRD RESERVATIONS WILL SAVE THE WATERFOWL

The immediate end to be sought is the stopping at once of any further inroads on the already badly depleted ranks of the ducks and geese. To effect this, regulations should be made which will shorten the open season and eliminate the market hunter. Later the task will be to restore the old-time abundance of waterfowl, at least as far as is consistent with the development of agriculture.

Fortunately this work can be turned over to the ducks and geese themselves. They have high reproductive powers in natural, undisturbed surroundings, and take kindly to any good offers of safe nurseries for ducklings. Hence has arisen the idea and practice of setting aside certain parts of the national domain as bird refuges or bird reservations.

The first of these—Pelican Island, Florida—was established by the executive order of President Roosevelt, March 14, 1903, and in the nine years to February 21, 1912, 56 such reservations had been segregated (see map, page 369). They are scattered over the possessions of the United States, from Alaska to Porto Rico and from Florida to California and Hawaii. They vary in size from Hog Island, Wisconsin, which contains only two acres—the home of a large colony of gulls—to the Hawaiian Island reservation, which extends over more than five degrees of longitude and includes the breeding grounds of more than a million sea birds.

Some reservations—Breton Island, Louisiana, for instance—serve for the winter protection of waterfowl; others, as the two in North Dakota, are in the center of the best duck-breeding grounds still left in the United States. The Yukon Delta reservation includes the largest breeding colonies of ducks and geese in Alaska, and with its several hundred

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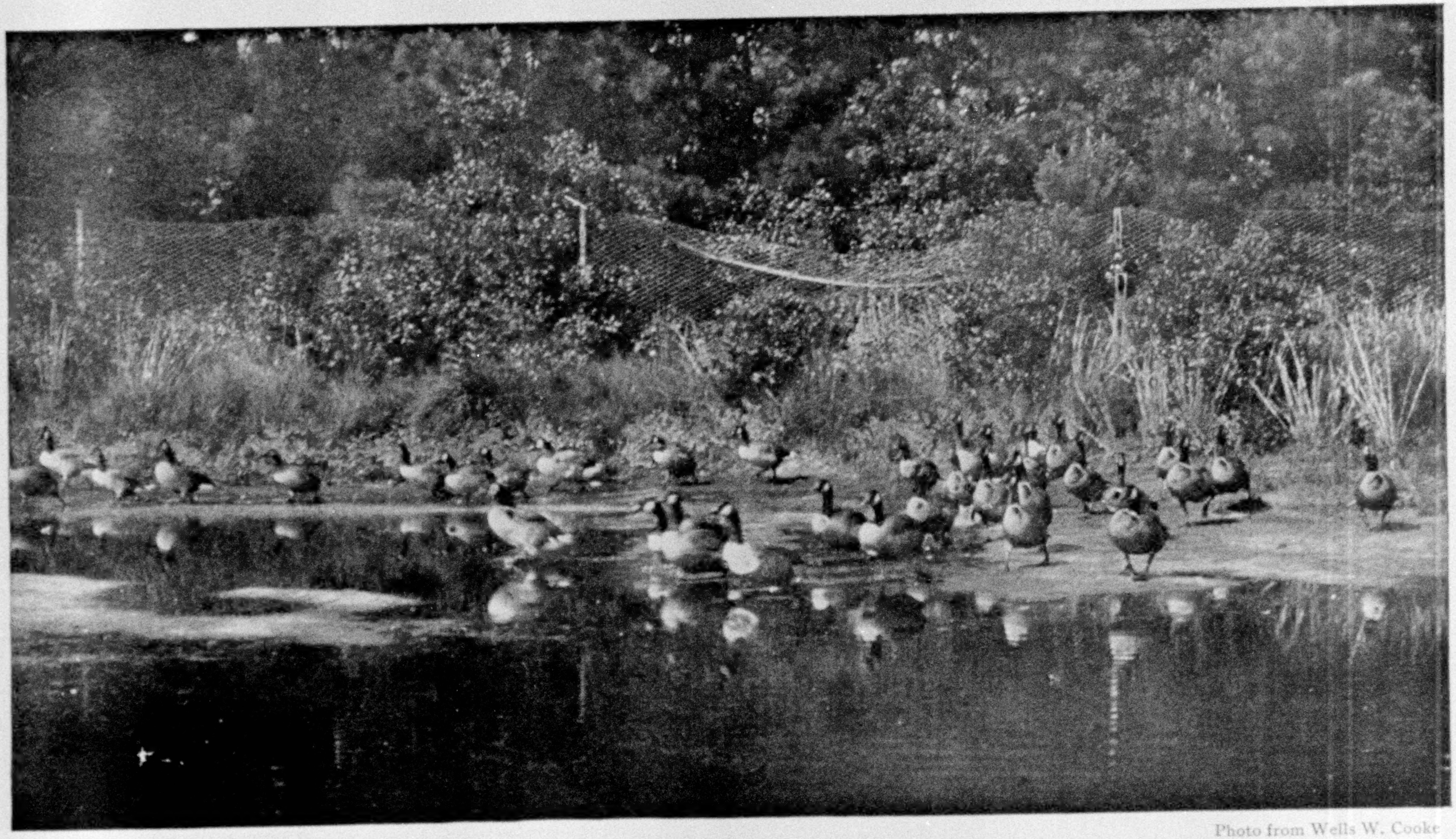

Photo from Wells W. Cooke

A GROUP OF DOMESTICATED CANADA WILD GEESE LEAVING THE SHORE FOR THEIR FEEDING GROUNDS IN CHINCOTEAGUE BAY, VIRGINIA

They roam 10 to 15 miles to neighboring islands and some remain away all winter; but in spring they return to the home pastures, where for years they have reared their young

thousand acres covers more territory than the entire lake region of North Dakota.

Shooting, trapping, or disturbing the birds in any manner is prohibited on all these reservations, whether they are to be nesting places in summer or refuges from man's attack during the winter.

GAME REFUGES IN LOUISIANA

The results of such local protection are often immediate and striking. In the San Luis Valley, Colorado, the safety afforded ducks on an artificial pond fed by an artesian well has induced the birds to resort there in larger and larger numbers every winter.

At Palm Beach, Florida, where no hunting is allowed within a mile of the town, ducks have become so tame that they will come for food within a few feet of a person (see cut, page 370), while outside the mile limit these same birds are so wild that it is difficult to get within gunshot range of them.

Private enterprise and generosity have joined forces with the national and State governments in extending protection to the birds. One of the most striking examples is the Ward-McIlhenny Game Refuge in southern Louisiana, in the very heart of the region already designated as the greatest winter home of ducks on the North American continent.

These two gentlemen—C. W. Ward and E. A. McIlhenny—purchased some 50,000 acres and hired game wardens at their own expense to patrol the district and prevent all shooting. Later they deeded 13,000 acres to the State of Louisiana to serve as a perpetual bird refuge (see map, page 373). This district had long been a favorite with the market gunner, and its 15 miles of now protected shore-line cannot fail to be a safe abiding place in winter for innumerable waterfowl.

Here is the principal winter home of the blue goose, one of the rarest and most interesting of North American geese (see cut, page 372). Going northward in the spring, their pathway can be traced until they reach Hudson Bay. There they disappear; the nest and eggs have never been found, and no white man has ever reported seeing a blue goose in the summer.

By exclusion and from the testimony of the natives, it is almost certain that they breed in the unexplored interior of the Labrador Peninsula. In the fall they reappear and move slowly south to the coast of Louisiana, where they are subject to increasing persecution. The Ward-McIlhenny Wildfowl Refuge, in the center of their winter range, will offer a welcome and much-needed shelter and go far toward preventing the total extinction of this rare species.

DOMESTICATION PROVED POSSIBLE

Artificial propagation is worthy of consideration. That this is feasible has been strikingly shown by J. W. Whealton, of Chincoteague Island, Virginia, who has been raising the Canada wild goose for more than 50 years, and some of his oldest and best pairs are well beyond the half-century mark; in fact, have had their golden weddings (see pages 378 and 379).

The homing instinct has become sufficiently developed for them to be trusted to feed at liberty, and the flocks, now numbering several hundred, forage on neighboring islands even 15 miles distant. No runaways have been known, and many pairs which spend the fall and winter on adjacent islands return regularly every spring to their breeding pastures and their old nests.

Even the black mallard, one of the wildest and most untamable of all waterfowl, has become semi-domesticated and has shown remarkable powers of reproduction; 1,200 ducks were raised in three years from a beginning of only 80 pairs. Mr. Whealton has also succeeded in breeding the greater snow goose, although its nest and eggs in the wild state are almost unknown.

THE NEW FEDERAL LAW

The closing hours of the last Congress were marked by the passage, late in February, of the McLean Bill for the protection of migratory game birds. This bill declares all migratory game birds "to be within the custody and protection of the government of the United States," and authorizes and directs the Department of Agriculture to prescribe and fix close seasons for their protection.

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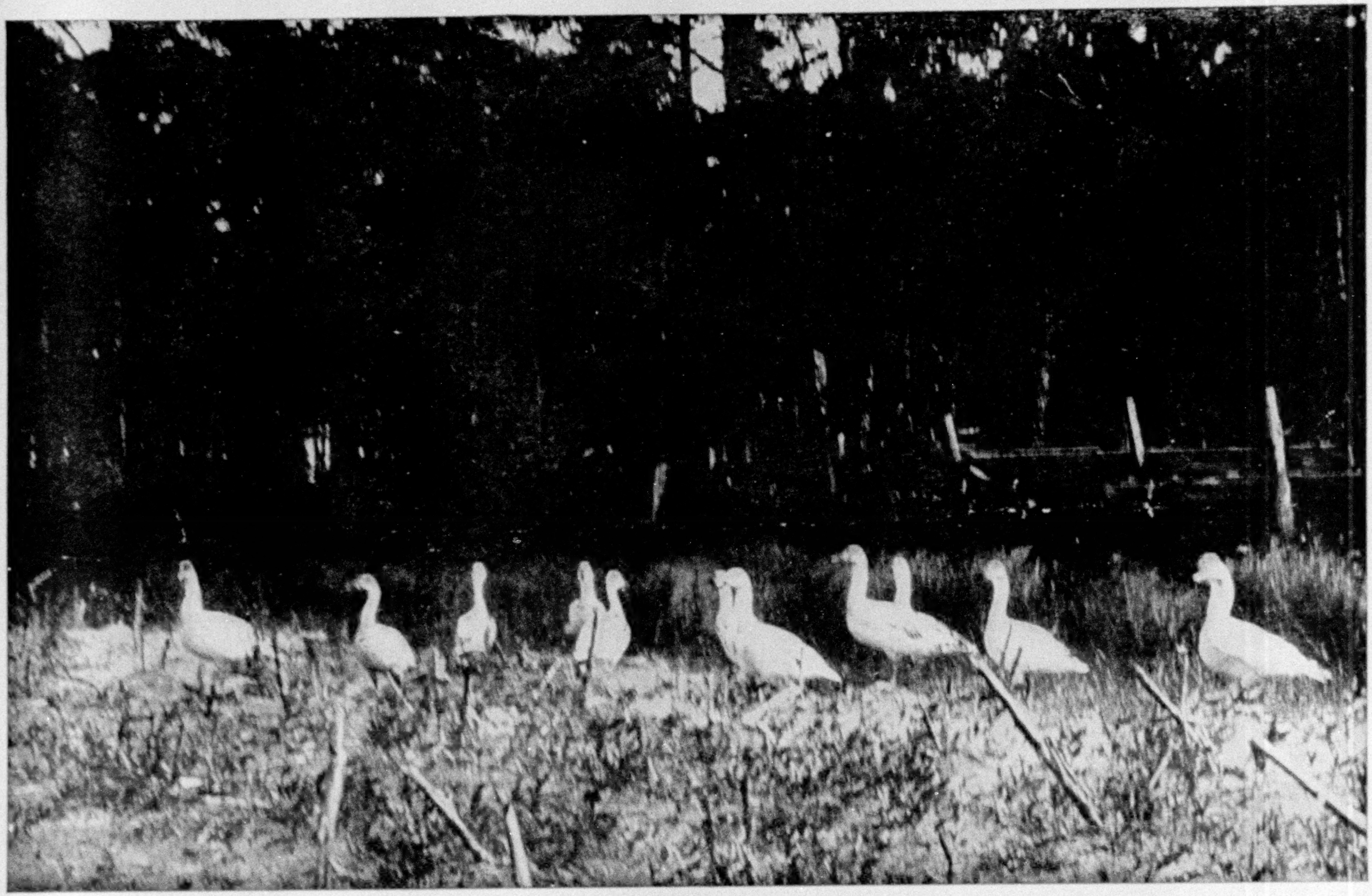


Photo from Wells W. Cooke

GREATER SNOW GEESE, ADULT AND YOUNG PAIRS: CHINCOTEAGUE, VIRGINIA

This flock is the first that has ever been raised in captivity. That artificial propagation of ducks and geese is feasible has been strikingly shown by J. W. Whealton, of Chincoteague Island, Virginia, who has been raising the Canada wild goose for more than 50 years. Some of his oldest and best pairs are well beyond the half-century mark (see text, page 377).

Photo from Wells W. Cooke

CANADA WILD GOOSE SITTING ON NEST AT THE BREEDING FARM OF J. M. WHEALTON: CHINCOTEAGUE ISLAND, VIRGINIA

This goose and her mate are over 50 years of age, and have come back to this nest voluntarily, spring after spring, for nearly half a century

This is easily the most important piece of game legislation that has ever been enacted. As the law does not go into effect until the first of July, the department has not yet promulgated its rules and regulations; but the curtailment of slaughter that is sure to follow this nation-wide attempt at game conservation cannot fail to have a marked effect in preserving and ultimately increasing the present remnants of the waterfowl.

It is exceedingly fortunate that this protective legislation has been taken in hand, for the McLean law will save our ducks and geese from the fate which has so unfortunately overtaken the passenger pigeon, which formerly existed in enormous numbers all over the country. Today this bird is entirely extinct, the last survivor dying in the Zoo at Cincinnati a few days ago.

J. J. Audubon, in his great work, "The Birds of America," in Vol. V, page 26, writes:

"The multitudes of wild pigeons in our woods are astonishing. Indeed, after having viewed them so often and under so many circumstances, I even now feel inclined to pause and assure myself that what I am going to relate is fact. Yet I have seen it all, and that, too, in the company of persons who, like myself, were struck with amazement.

"In the autumn of 1813 I left my house at Henderson, on the banks of the Ohio, on my way to Louisville. In passing over the barrens, a few miles beyond Hardensburgh, I observed the pigeons flying from northeast to southwest in greater numbers than I thought I had ever seen them before, and feeling an inclination to count the flocks that might pass within the reach of my eye in one hour, I dismounted, seated myself on an eminence, and began to mark with my pencil, making a dot for every flock that passed. In a short time, finding the task which I had undertaken impracticable, as the birds poured on in countless multitudes, I rose, and counting the dots then put down, found that 163 had been made in 21 minutes. I traveled on and still met more the farther I proceeded. The air was literally filled with pigeons; the light of noonday was obscured as by an eclipse; the dung fell in spots, not unlike melting flakes of snow, and the continued buzz of wings had a tendency to lull my senses to repose.

"Before sunset I reached Louisville, distant from Hardensburgh 55 miles. The pigeons were still passing in undiminished numbers and continued to do so for three days in succession. The people were all in arms. The banks of the Ohio were crowded with men and boys, incessantly shooting at the pilgrims, which there flew lower as they passed the river. Multitudes were thus destroyed. For a week or more the population fed on no other flesh than that of pigeons and talked of nothing but pigeons."

FURTHER TESTIMONY

So, too, Elliott Coues, writing in 1897 in his "Key to North American Birds," Vol. II, page 712, comments on their threatened extinction thus:

"We do not now have the millions that the earlier writers speak of in the eastern United States, and no contract for service has for many years included a clause that the hireling should not be fed too often on wild pigeons or salmon; but I remember one great flight over Washington, D. C., when I was a boy, about 1858, and I witnessed in 1873 another, of countless thousands, on Red River of the North. The greatest roosts and flights we now (1897) hear of are in the upper Mississippi Valley, though some of the birds may still breed in various wooded places all along our northern border and northward to Hudson's Bay. The wild pigeon seems now a passenger to happier hunting-grounds than it or the Indian has ever found in this country in the wake of the bison and the fur seal. It has been often subjected to merciless and almost wanton destruction by hundreds of thousands at a single roost in a single season; and, if it is not entirely exterminated soon, it will be only because there are too few left to pay for persecution."

From such a fate the McLean law has saved our ducks and geese, and, as its administration will be in the hands of the U. S. Department of Agriculture, it is certain that adequate steps will be taken to conserve and increase what is undoubtedly a great national asset.

WANDERING ISLANDS IN THE RIO GRANDE

By Mrs. Albert S. Burleson

THE migratory habits of certain small bodies of land inhabiting the Rio Grande and known as "cut-offs," or "bancos," have been the occasion of protracted diplomatic correspondence and discussion between the United States and Mexico.

Their refusal to remain permanently attached to one or the other of the river's banks deprived them of a fixed legal status as either Mexican or American territory and brought about their participation in many illegal and unrighteous adventures, which in turn led to misunderstandings between the two countries.

Inherently weak by reason of a loose, sandy soil, they are an easy prey to the power of the Rio Grande, a river of unusual and striking characteristics and revolutionary action.

No one with an intimate knowledge of a great river will wonder at the homage so frequently offered it by early peoples. Its personality is so real to those who have lived by it and on it and know some of the many things it can do that they come to have a feeling akin to the blind fear and admiration expressed toward certain rivers in many acts by primitive races.

A RIVER OF UNSETTLED HABITS

In no river is spirit more evident than in the Rio Grande. From its birthplace in the snows of Colorado to where its flood meets the tides of the Gulf of Mexico, it seems a sentient intelligence, laden with messages for the country through which it passes.

Its power to do good or to withhold it is apparent in the creation of rich alluvial valleys, or when it plunges through rock-bound canyons, leaving the country for miles on either side a voiceless desert. Throughout its length it seems to brood over the land for good or for evil. Along its sinuous route below Rio Grande City it pushes it's way through miles of level sand in its final reach to the Gulf, twisting and doubling upon itself like a great sea serpent.

For centuries it had coiled and uncoiled and straightened itself again in the yielding sands of the semi-arid region, with none to heed its vagaries, until Mexico and the United States, by the Treaty of Guadaloupe Hidalgo, in the year 1848, fixed upon it as the boundary line between the two countries and thereby brought it under international supervision. Its unsettled habits were recognized, however, and in the earliest convention on the boundary question every effort was made to provide against future misunderstandings arising between the two countries because of them.

The boundary was to be the "middle of the river, following the deepest channel." This seemed clear, and took practical note of the river's shifting current, and neither side foresaw that it would not prove broad enough to cover the good intention of each to the other.

But the Rio Grande possessed characteristics that had not impressed themselves upon the framers of the convention as possible causes of friction between the people living along its banks. In addition to its eroding power, exercised through long months of low and mean water, it could during flood periods leap with torrential force across a narrow neck of land at the base of one of its long loops and cut for itself a new channel.

WHAT A BANCO IS

Through such avulsive action of the river, Texas soil would sometimes become Mexican, and on occasions a plantation occupied by jacals and Mexican citizens would over night find itself a part of Texas—and behold a banco!*

To meet this condition a new conven-

*A banco is the non-descriptive term—eluding translation, but whose nearest English equivalent is cut-off—applied to those portions of the territory thus separated from the mainland by the river.

AN ILLUSTRATION OF HOW THE RIO GRANDE FORMS A NEW BANCO

The river is flowing straight across the front of the picture, from right to left. The trees on the left are on the Mexican bank and the boat is on the American bank. The broad stream in the center of the picture was formerly the course of the river, and the trees on the right once stood on the American bank. They have now been cut to the Mexican side and, with the land on which they stand, form a new banco.

tion was negotiated, providing that no such avulsive action of the river should be permitted to change the boundary line as determined by the original survey, but that the line should "continue to follow the middle of the original channel bed, even though this should become wholly dry or be obstructed by deposits." Each banco, or cut-off, therefore, though unmoored from its mother country, was to be regarded as a part of it, with no change of allegiance or jurisdiction.

But the river still held revelations for the treaty-makers, and the carefully framed articles, which had considered natural changes in the boundary line due to "slow and gradual erosion and deposit of alluvium," and also to avulsion, "by the abandonment of an existing river bed and the opening of a new one," had not reckoned with the result of a combination of such changes.

When, after forming a banco, or cut-off, the river, by wearing into the opposite bank, would enlarge the banco by accretion, the ownership of the new land would immediately become the subject of dispute.

To whom should it belong? To the owner of the banco, or to the man whose land formerly faced the river and was now separated from it by an intruder from the other side, but whose country claimed jurisdiction to the middle of the river's channel?

HOW A RIVER WORRIED STATESMEN

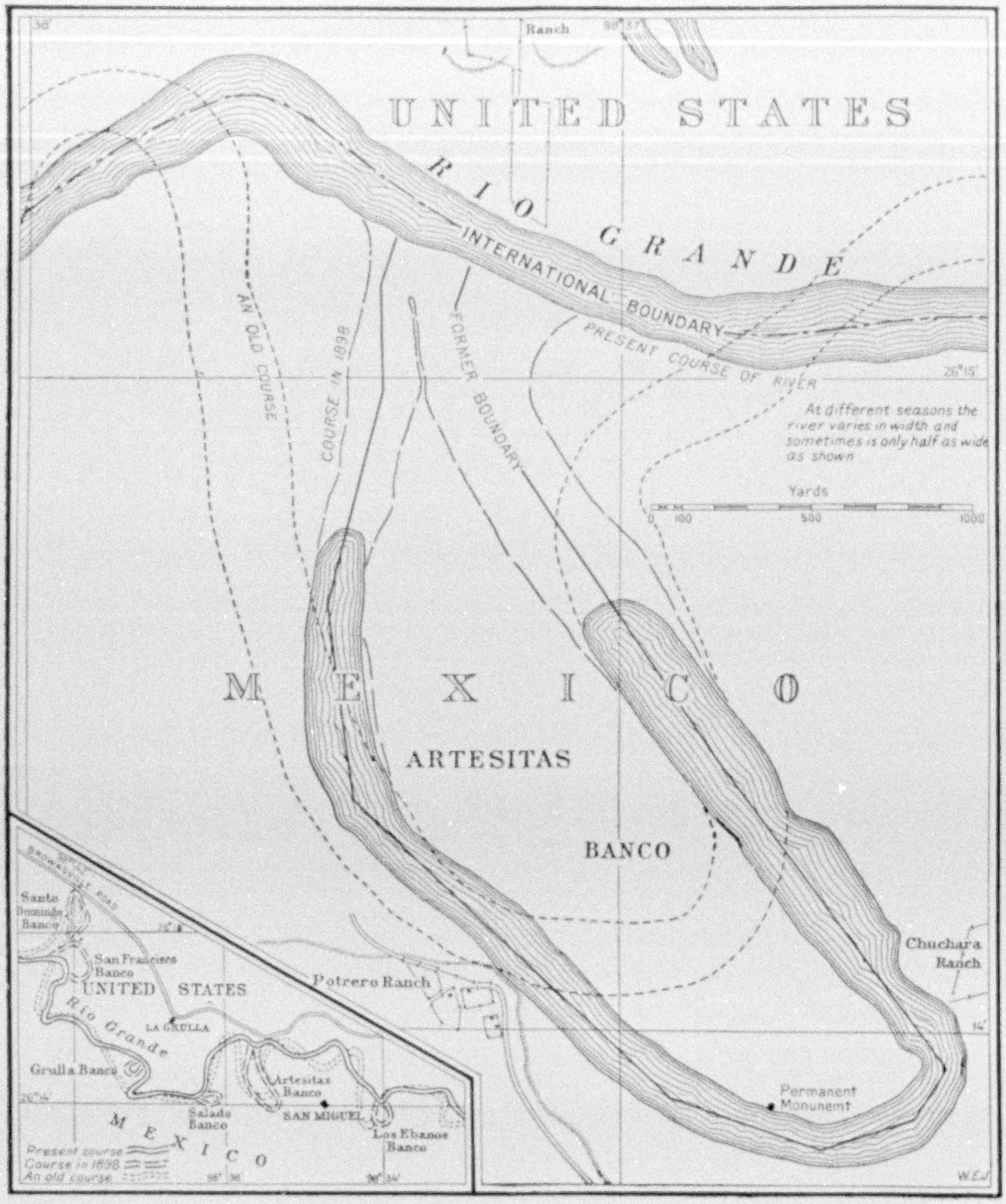
An example will serve to show both the extraordinary actions of the river and the difficulties in the way of any satisfactory adjustment of conflicting interests.

In the year 1851 a certain Josiah Turner began to farm the Galveston Ranch, on the Texan bank of the Rio Grande. In 1859 he was greatly surprised when 221 acres of Mexican land suddenly came across the river and attached itself to his ranch. An arrangement was effected by which he became the owner of this land, which is now known as the Soliseño Banco. The river was tranquil until 1865, when it cut off a piece of Mr. Turner's land and took it to Mexico, and there part of it remains to this day. The other part was gradually washed away; but in 1886 the river made up its mind to repay the farmer for what it had taken from him 21 years before, and so carried back into Texas a piece of land far larger than the tract originally lost. But, unfortunately for the good intentions of the river, the land it restored belonged to owners on the Mexican side, and although it had attached itself to Mr. Turner's land and had apparently become an inseparable part of it, the Mexican owners claimed possession.

So great was the confusion of boundary lines, the disturbance of private and public titles to lands, and so many were the conflicts of jurisdiction between the two governments following upon such freakish actions of the river, that a new convention, dealing with the questions under dispute, became necessary. To hasten action upon these and other matters related to the boundary line and threatening the amicable relations of the two countries, it was found advisable to create a boundary commission clothed with authority to investigate and determine the merits of each contest.

Composed of two members, one appointed by each country, the only limit placed upon its discretionary power was the privilege, reserved by each government, to object within 30 days to its findings. Any question upon which the commissioners failed to agree was to be referred to the state departments of their respective governments, to await final disposition through the slow process of diplomatic correspondence.

In view of the extended authority reposed in this international court and the importance and delicacy of the questions brought before it, many of them complicated by ill-feeling upon the part of the complainants, it is fortunate for this country that President Cleveland's choice of the United States Commissioner should have fallen upon Brigadier General Anson Mills, U. S. Army—a man eminently fitted to perform the duties of the position. To his fine discrimination, patience, and tact we owe the final solution of the banco problem. It seems simple, now that we have it, but when General Mills took up its consideration he found it a maze in which the diplomats of both countries



MAP TO ILLUSTRATE THE WANDERINGS OF THE RIO GRANDE AND OF THE OLD BOUNDARY

had been hopelessly wandering for years.

The initial case brought before him and his Mexican colleague in their capacity as commissioners was typical of all the others. Mexicans had been imprisoned on the American side and Americans had been imprisoned on the Mexican side; troops of both countries had been ordered out to protect its citizens; both sides claimed their laws to have been violated; neither was willing to yield jurisdiction to the other. The next step might be riot and bloodshed. This state of things, with endless variations, but always underlying it the probability of clash between the two peoples, prevailed throughout the banco region from Rio Grande City to the Gulf.

Small in area, rarely attaining to 500 acres in extent, not always arable, and rarely inhabited, many of them, indeed, mere sand banks, these bancos are yet rich in mystery and romance. About them has raged for years border conflicts

that have crowded the dockets of the Texas Federal courts and piled high our official correspondence with Mexico.

Oftentimes surrounded by a deep bayou, which marks the lazy trail of the river as it followed the line of least resistance through the loose soil, the banco, like a moated castle of medieval days, has become a stronghold for murderers, thieves, and smugglers. Here criminals have been able to defy the operation of the laws of both countries. Convictions are rarely possible when witnesses are always at hand ready to swear that the banco belongs to either Mexico or the United States, as the exigencies of the case may require.

The zeal of a revenue officer oftener than not only means new difficulties—fresh strain on our relations with Mexico, with the silent work of the stiletto, perhaps, added to complicate the affair.

HOW THE PROBLEM WAS SOLVED

A resurvey of the river made by the engineers attached to the boundary commission showed these "cut-offs" in every stage of existence. Some were still surrounded by water; around others the old bed of the river, though dry, could be plainly followed; while still others showed scarcely a trace of the old channel, which had filled up with alluvium and become in some instances covered with brush or heavily timbered. Many of the bancos appearing on the map of the original survey made in 1853 were gone; many new ones and some in process of formation appeared in the new survey.

To follow this devious line and mark it as the boundary between the two countries, according to the latest treaty stipulation, would entail upon both a protracted and costly work.

Thoroughly familiar, from boyhood, with the Rio Grande and having also in later years given it the careful study of an engineer, General Mills knew that in the course of another 50 years the great, stealthy river would make still a different map—obliterating old bancos and forming new ones, sweeping away many of the boundary monuments and necessitating a repetition of the whole laborious work.

It was here that the General drew his pencil through the troublesome little "cut-offs" and sent in his recommendation to the department that they be forever eliminated from the boundary line, all those occurring on the right of the river to pass to the jurisdiction of Mexico, those on the left bank to that of Texas. The inhabitants, if any, should retain their citizenship in the country from which they had been so suddenly and violently detached, or they might acquire the nationality of the country to which the banco would now belong. Any cut-off exceeding 650 acres in area and having a population of over 200 souls was not to be considered a banco, and the old bed of the river should remain the boundary.

AN EFFECTIVE AND EQUITABLE DECISION

By this arrangement neither country suffered any appreciable loss of territory, for the bancos migrate with great impartiality from one side or the other.

The effectiveness of this plan was so apparent that it was promptly approved by our State Department. In Mexico the proposition, though heartily indorsed by the Mexican Commissioner, was held up upon the constitutional ground that the Mexican State Department had no right to cede any portion of Mexico's territory to another country, and it was referred to a Senate committee for consideration.

But legislative action followed so slowly that it was several years before Mexico, having in the meantime exhausted every possible effort to find a different way out of the difficulty, agreed to the elimination of the bancos. A convention was finally negotiated and sent to the United States Senate for ratification. There it was met by a protest from citizens of Texas living in Brownsville; and although this proved upon investigation to be nothing more than the cry of some questionable characters, whose activities in the field of smuggling would thereby be curtailed, it succeeded in delaying action upon the treaty for two years.

During the closing days of the 60th Congress the convention was at last ratified by the United States Senate. Two days later the Mexican Senate confirmed it. Today it stands in both countries as the supreme law on the much-agitated boundary question.

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During the five years that have elapsed since the conclusion of the treaty a commission of American and Mexican engineers has been constantly at work surveying the river, locating new bancos, and, on the basis described above, determining to which country they belong.

At the end of December, 1912, the commission had located, surveyed, and mapped 89 bancos situated in the lower reaches of the river between Rio Grande City and its mouth. On each of these bancos a permanent monument has been erected, by means of which and the maps which have been prepared any given banco can now be identified, no matter what the action of the river may have been in the meantime.

Thus the great turbid, silt-bearing river is left to pursue its way untrammeled; but the terrors so long synonymous with its name have through the operation of this equable arrangement become a part of the storied, romantic past.

Photo by A. Y. Tugarinoff, Curator Krasnoyarsk Museum, Siberia

A LIVE SABLE IN THE MUSEUM AT KRASNOYARSK, SIBERIA

Mr. Frank N. Meyer, an agricultural explorer of the U. S. Department of Agriculture, suggests that it might be a profitable venture for Americans in the northern Rocky Mountain region to import a few pairs of the dark-skinned sables from the Krasnoyarsk district, Siberia, with a view to breeding sables in America, just as blue and silver foxes are now bred successfully in eastern Canada. The opinion among Russian hunters and fur dealers is that the sable is not a difficult animal to manage, though it is reputed very fierce, cruel, and bloodthirsty. Owing to the great decrease in the number of sables captured, the price of the skin has mounted very rapidly, and now ranges from $20 to $154 per skin. The Russian government has become so alarmed at the rapid decrease in the numbers of sable in Siberia that it has prohibited the hunting or trapping of this valuable animal for three years.

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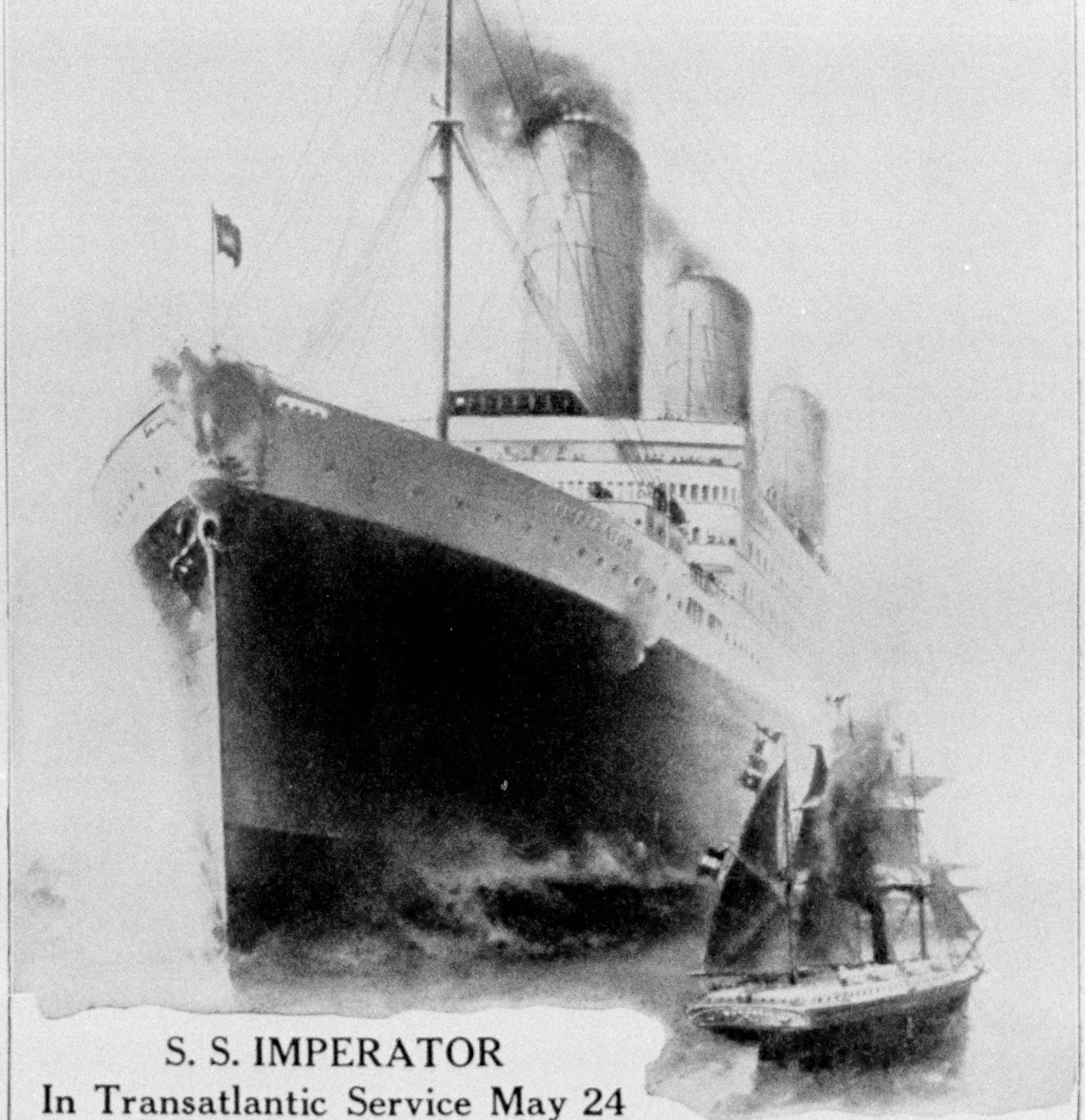

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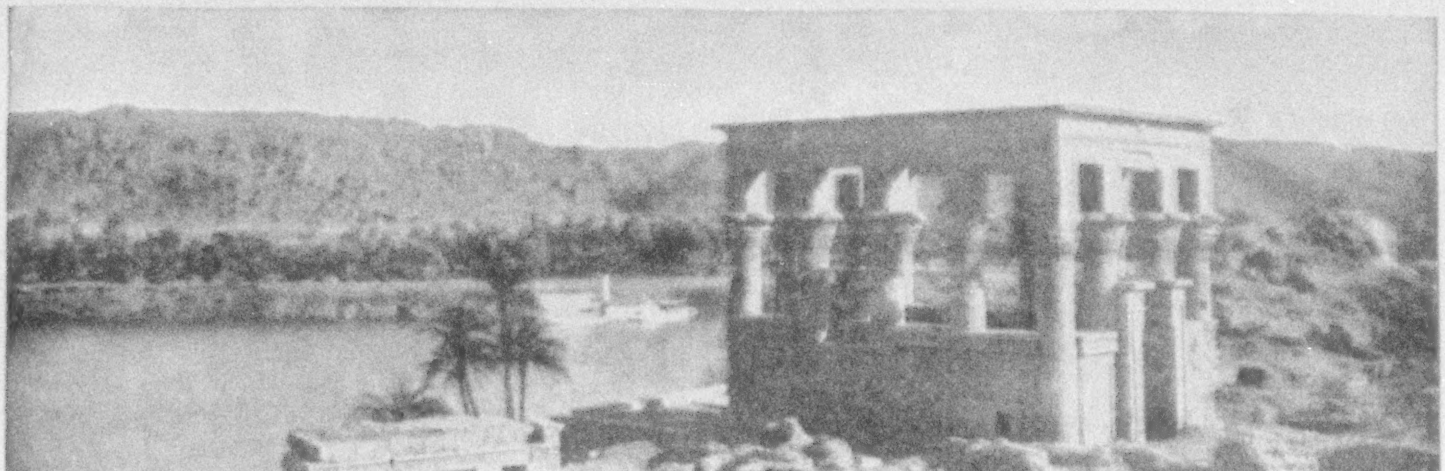

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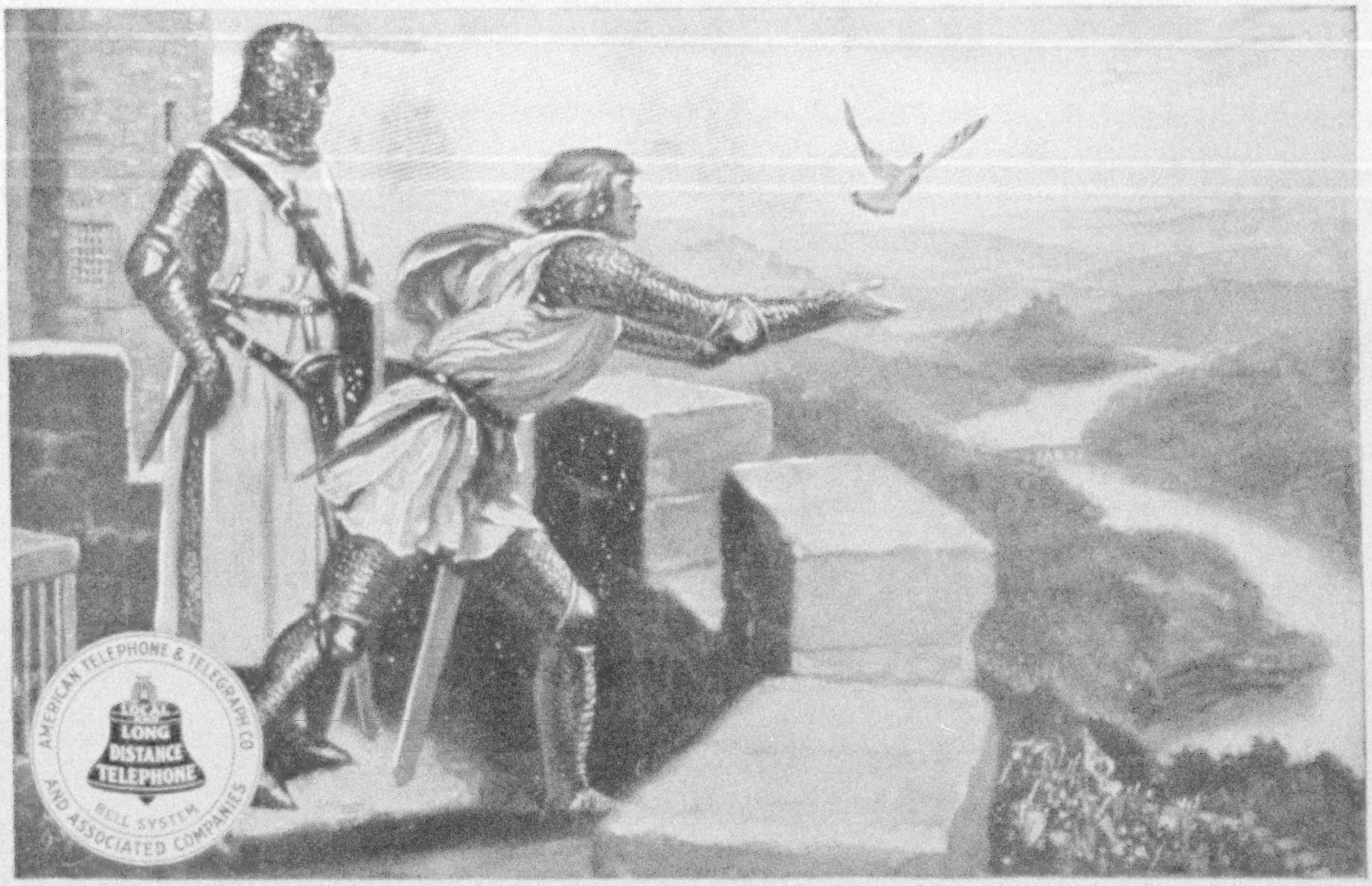

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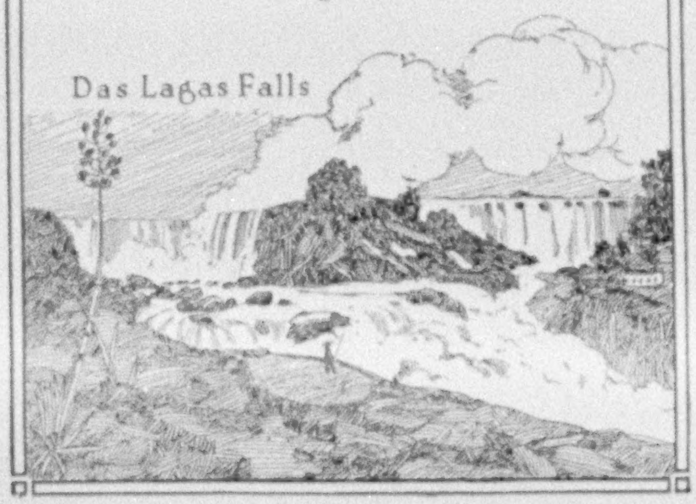

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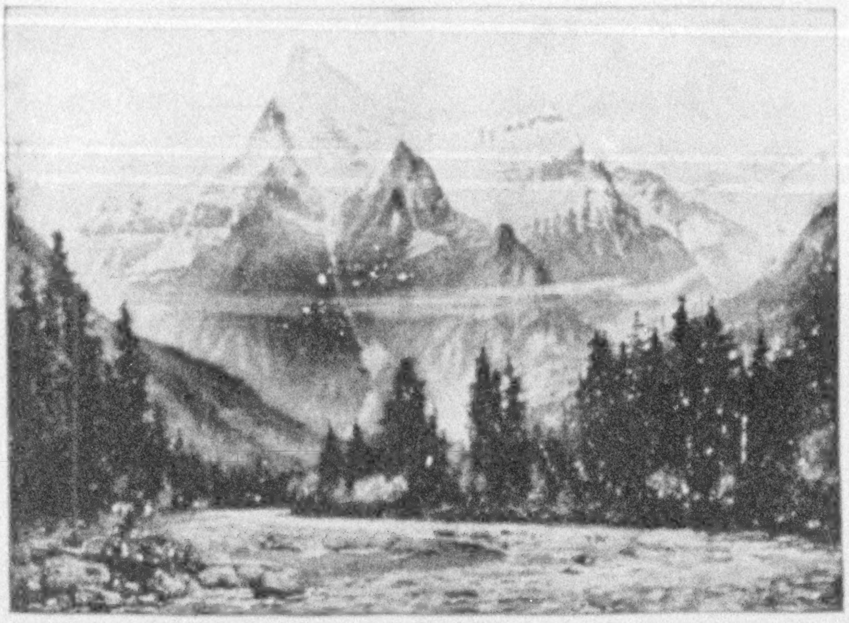

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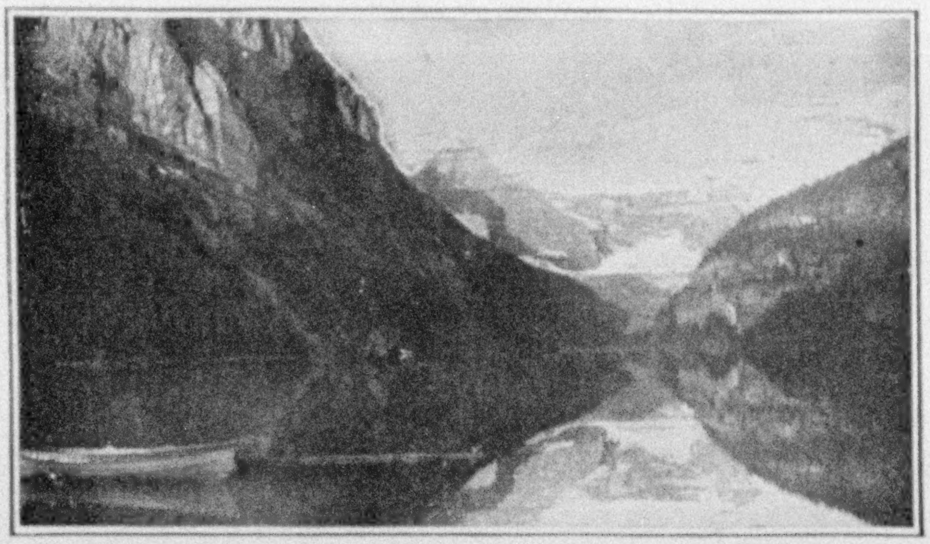

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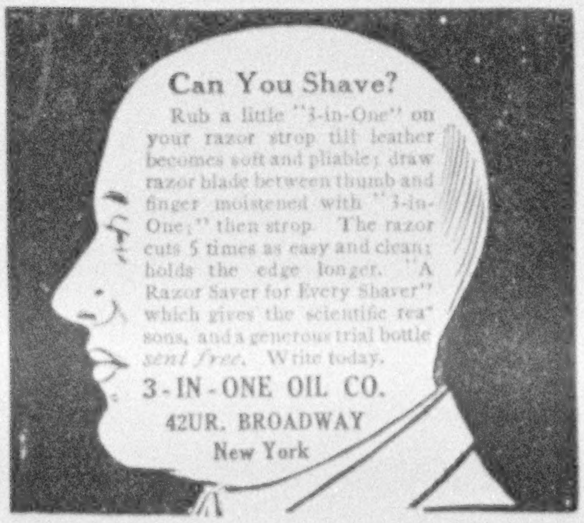

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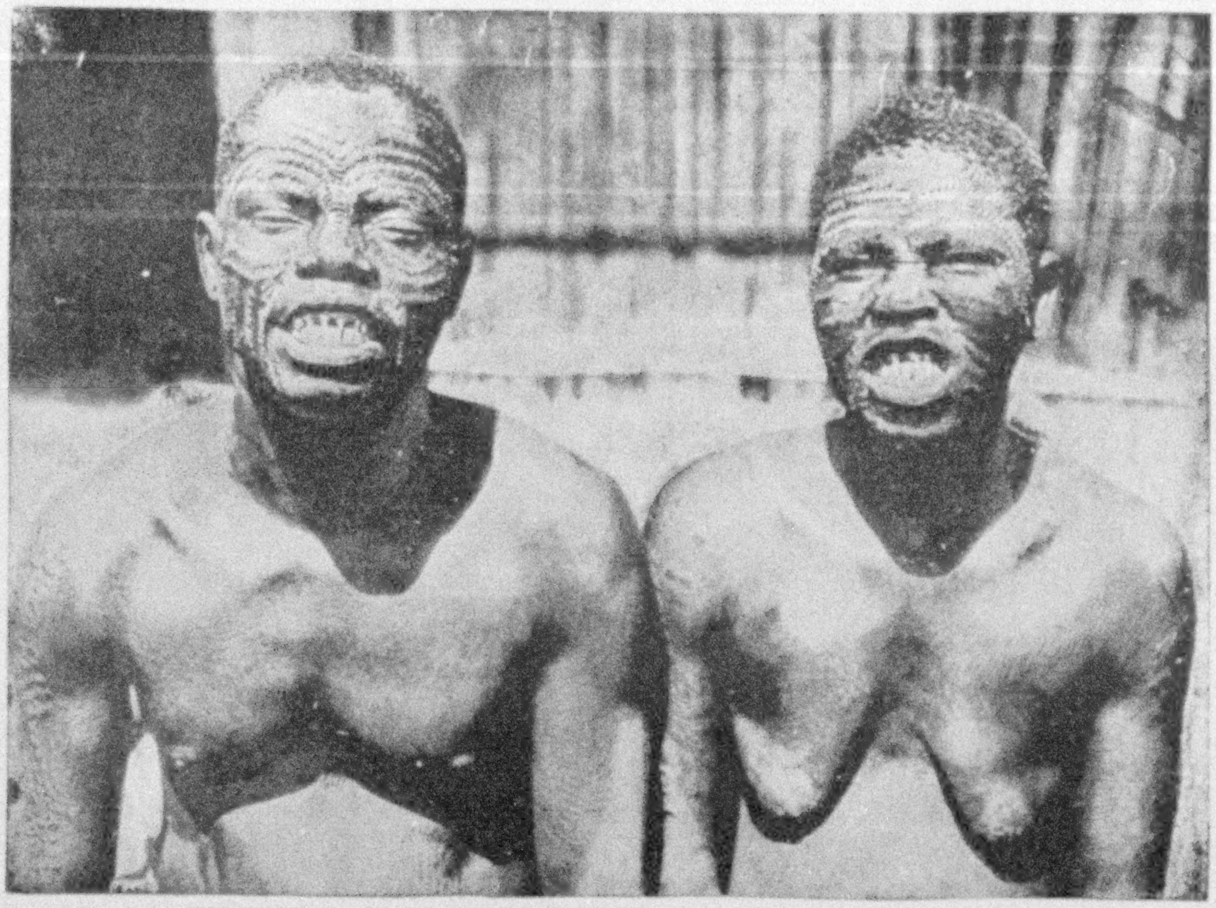
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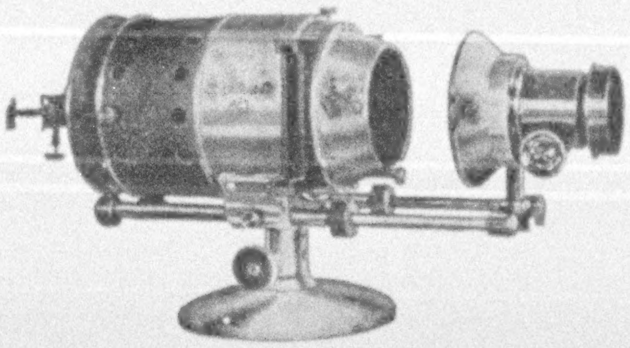

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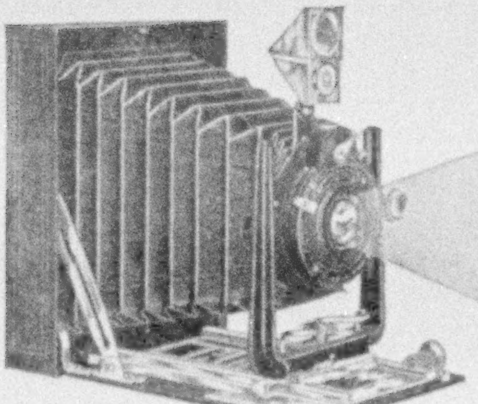

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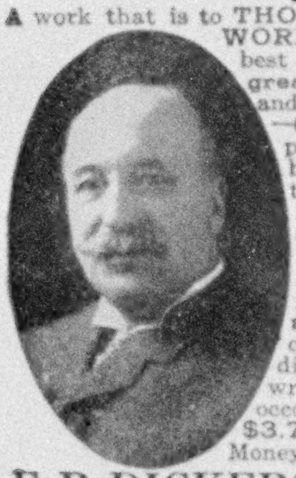

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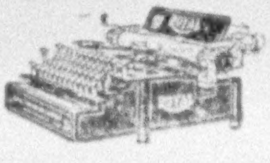

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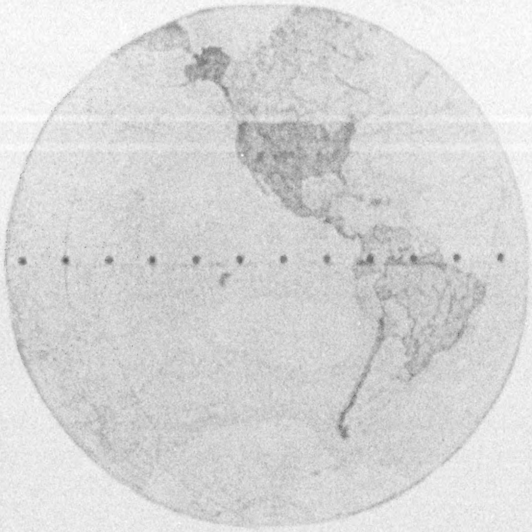

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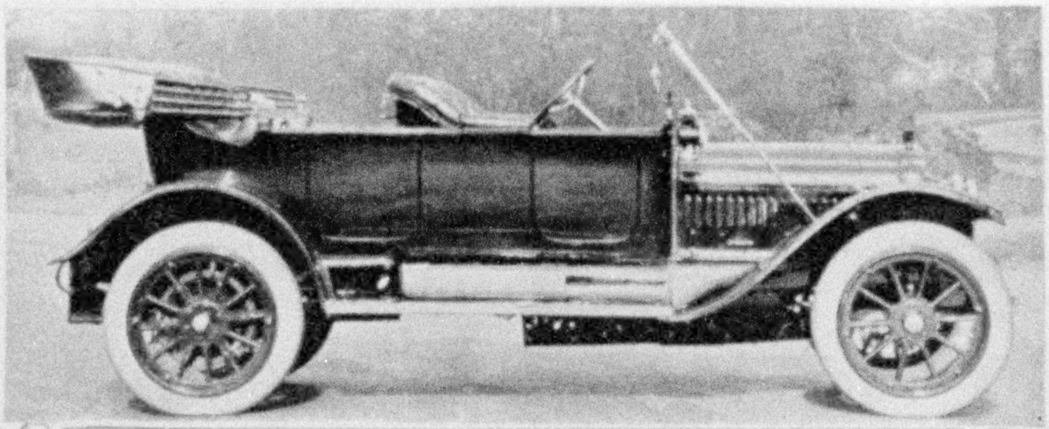

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